November 7, 1893.

Sir W. H. Flower, K.C.B., LL.D., F.R.S., President, in the Chair.

The Secretary read the following reports on the additions made to the Society's Menagerie during the months of June, July, August, and September, 1893 :—

The registered additions to the Society's Menagerie during the month of June were 146, of which 71 were by presentation, 24 by purchase, 24 by birth, and 27 were received on deposit. The total number of departures during the same period by death and removals was 106.

The most noticeable additions during the month were :—

1. Four South Island Robins (*Miro albifrons*) from New Zealand, presented by Captain Edgar J. Evans, June 6th, being the first examples of these interesting Antipodean representatives of the Europeau Robin that have reached us.

2. An adult male of Stairs's Monkey, *Cercopithecus stairsi*, presented by Mr. F. Hintz on June 7th.

It is of great interest to receive a second specimen of this well-marked Monkey, which I have lately described from a specimen living in the Society's Gardens (see P. Z. S. 1892, p. 580, pl. xl.).

In reply to inquiries, Mr. Hintz informs me that the Monkey was brought by his brother from Mozambique about eight years ago. When first obtained it was quite young and only about 20 inches in length; it is now obviously quite adult and agrees generally with the figure above referred to. It measures in length of body about 18 inches, tail only 7 inches, the apical portion of the tail being absent: in colour it nearly resembles the first specimen, having the same characteristic rufous bands on each side of the head; but it also shows a patch of rufous on the rump, just above the tail, which was not noticeable in that specimen.

The arms outside are black-grey, the hands quite black; the legs outside are grey; the feet are not quite so black as the hands; the back of the shoulders is dark grey, the back itself, especially the lower part, of a yellowish grey; the anal region and about 3 inches at the base of the tail are rufous; the scrotum is very dark blue (indigo): the inuer side of the limbs and the belly are milky white; the face is black. There are two patches of chestnut-coloured hair on the forehead, next the ears, as in the former example. The whole of the hair of the upper parts is minutely grizzled.

Compared with the young female figured P. Z. S. 1892, pl. xl., the present animal is more darkly coloured. It has not the yellowish back such as the young female had.

3. A family of six European Beavers, consisting of a male, a female, and four young ones, from the Lower Rhone, purchased (of Mr. Vergnier Cantarel, of Toulouse, and received) June 29.

I am not aware that specimens of the European Beaver (*Castor*

fiber) have been previously exhibited in the Society's Gardens. In general appearance these animals are certainly easily distinguishable from the American form, of which we have several specimens, being much browner in colour.

The registered additions to the Society's Menagerie during the month of July were 165 in number; of these 58 were acquired by presentation, 44 by purchase, 44 by birth, and 19 were received on deposit. The total number of departures during the same period by death and removals was 115.

The registered additions to the Society's Menagerie during the month of August were 208; of these 130 were acquired by presentation, 13 by purchase, 14 by birth, 1 by exchange, and 51 were received on deposit. The total number of departures during the same period by death and removals was 137.

The registered additions to the Society's Menagerie during the month of September were 96; of these 54 were acquired by presentation, 21 by purchase, 8 were bred in the Gardens, and 13 were received on deposit. The total number of departures during the same period by death and removals was 108.

Amongst the additions I may invite special attention to the following:—

1. A young Corean Sea-Eagle (*Haliaëtus branickii*), obtained direct from Corea by the authorities of the Zoological Gardens of Hamburg, and purchased from them Sept. 21st. The example is very small in size, but is apparently a young male of this species. (*Cf.* Bolau, P. Z. S. 1892, p. 173.)

2. A fine specimen of the Great Grebe of Antarctic America (*Æchmophorus major*) in full plumage, new to the Collection, obtained by purchase. I exhibit a coloured drawing of this bird, which is the first specimen of the species that I have seen alive,

I also take this opportunity of exhibiting a living example of the Goliath Beetle (*Goliathus druryi*), which was presented to the Society by Mr. Frederic W. Marshall, of Reed Vale, Teignmouth. Mr. Marshall informs me that he received this insect alive, but weak, on the 16th May last. It was brought to him from Eastern Akim, some 4 or 5 days' journey from Accra.

It seems to do well in our Insect House, and feeds readily on melon. It has also eaten grapes and very ripe pears, but prefers melon to any other food. It drinks tea and cocoa.

The Beetle is of course well known, but, so far as I am aware, no living specimen has previously been brought to England. The present example has been figured in the 'Field,' Oct. 21, 1893, p. 607.

Mr. Sclater offered a few remarks on the Zoological Gardens of Stuttgart, Frankfort, and Cologne, which he had visited during the past summer.

In Herr Nill's little garden at Stuttgart were observed good examples of *Struthio molybdophanes* from Somaliland, and a fine and very tame pair of the Great Anteater (*Myrmecophaga jubata*).

In the Zoological Garden of Frankfort, where Dr. Seitz had

lately become Director, there were a pair of the Black-tailed Gnu (*Connochætes gorgon*), a male and two females of *Cobus sing-sing*, and examples of *Galidia elegans* and *Bucorax abyssinicus*. The series of German native birds was large and contained a specimen of *Melanocorypha yeltoniensis*, and of several other species rarely seen in captivity.

In the Zoological Garden of Cologne there were many fine Antelopes—*Hippotragus equinus*, *Cobus sing-sing*, *Oryx leucoryx* (♂, ♀, et ♀ jr.), and *Bubalis mauritanica* (♂, ♀, ♀, ♀ jr.),—besides examples of such scarce mammals as *Bassaris astuta* (♂ et ♀), *Ursus ornatus*, and *Microcebus myoxinus*. Amongst the birds Mr. Sclater had noticed specimens of *Geophaps plumifera*, *Crax albini*, *Plectropterus niger*, *Anas andamanensis*, *Haliaëtus branickii*, and *Chunga burmeisteri*.

The following extract was read from a letter addressed to Mr. Sclater by Mr. J. G. Millais, F.Z.S., dated "Kroonstad, Orange Free State, September 19, 1893":—

"I have been all this year far in the heart of Eastern Mashonaland, searching for that much-desired creature the White Rhinoceros (*Rhinoceros simus*), and, though I did not get one, I found what was most undoubtedly its spoor and droppings. I do not at present wish to particularize the place too exactly, but it lies in the most horrible thirst-land on the earth, and it was only with considerable difficulty that I managed to get back to one of the big rivers, having nearly died of thirst. I took a small wagon, which I and our old Dutch hunter had constructed out of wheels and logs, and this we found the donkeys could hardly pull through the dense bush, which must be passed through to get to this unholy country. On arriving at the pan where a black hunter had told me the animals drank, we found that it was dry, and though the spot was still damp we could do nothing but make all possible haste back to the mountains, to obtain water for ourselves and our emaciated beasts. To make matters worse, my companion was seized with dysentery. Moreover, a lion came in the night into a native village and killed three of my best donkeys. Thus we got stuck a week without being able to move, having a real bad time with the natives, who saw our condition and would have stolen everything of value if they could.

"I am quite sure the Rhinoceroses could be obtained, from what I learnt from the natives, but the country would have to be approached from an entirely different direction and with pack-donkeys.

"The natives know and describe the two species of Rhinoceros quite correctly. One, the white, which they call *m'combo*, they say feeds only on grass, has a square mouth, and the females drive their calves in front. The black is much more savage, feeds on bushes, has a long lip, and the calves follow the mother. This shows that they know the animal well, although they admit that it is scarce."

The Secretary read the following extract of a letter addressed to him by Babu Ram Bramha Sányál, C.M.Z.S., dated Zoological Garden, Calcutta, July 27, 1893 :—

"I am not aware whether closely allied species of *Semnopitheci* have ever interbred anywhere. They are rather exclusive in their ideas in respect to matrimonial relationship. Anyhow, such an event has just happened in this Garden. The Phayre's Leaf Monkey (*Semnopithecus phayrei*, Blyth) has given birth to a young one—a lovely little babe, of a delicate light orange colour. As there has been no other male in the same cage except the *S. cristatus*, there is no doubt of the young one being a hybrid between these two species. These Monkeys have been living together since 1880, and although they agreed very well, they were never observed to be over friendly. Even now the male does not appear to take any interest in the offspring."

A drawing of the mother, and young one at two weeks old, was exhibited.

In the course of some remarks on the preceding communication,

Cercopithecus lalandii (mother and young).

Mr. Sclater stated that during the past ten years five Monkeys of the

genera *Macacus* and *Cercopithecus* had been born in the Society's gardens, namely :—

Macacus sinicus, April 2, 1885.
Macacus rhesus, April 6, 1887.
Cercopithecus callitrichus, Feb. 22, 1890.
Macacus rhesus, March 31, 1890.
Cercopithecus lalandii, June 11, 1893.

Concerning the last birth a curious fact had been observed and reported by the keepers—that the young monkey, which lived about two months, had been in the habit of sucking both of the mother's teats at once, as shown in the sketch taken by Mr. Holding (see p. 615), who had himself witnessed the act.

Mr. Tegetmeier exhibited a mounted specimen of a Grouse from Scotland, supposed to be a hybrid between *Tetrao tetrix* and *Lagopus scoticus*.

Mr. G. A. Boulenger, F.Z.S., read a paper "On a Nothosaurian Reptile from the Trias of Lombardy, apparently referable to *Lariosaurus*." His description was based on a small, nearly perfect specimen from Perledo, showing the ventral aspect, belonging to the Senckenberg Museum in Frankfort-on-Main, which had been intrusted to him by the Directors of that institution and was exhibited before the Meeting. The author pointed out the presence of a series of minute teeth on the pterygoid bones, and of an entepicondylar (ulnar) foramen in the humerus. The number of phalanges was 2, 3, 4, 4, 3 in the manus, and 2, 3, 4, 5, 4 in the pes ; the terminal phalanx was flattened and obtusely pointed, not claw-shaped. In discussing the affinities of this reptile the author stated that the *Lariosaurus* described by Diecke did not appear to be generically distinguishable from the *Neusticosaurus* of Seeley, which he referred to the *Lariosauridæ*, regarding that family as intermediate between the *Mesosauridæ* and the *Nothosauridæ*, though nearer the latter. The *Mesosauridæ*, in his opinion, formed one suborder, the *Lariosauridæ* and *Nothosauridæ* together a second suborder, of the order *Plesiosauria*.

This paper will be printed entire in the Society's 'Transactions.'

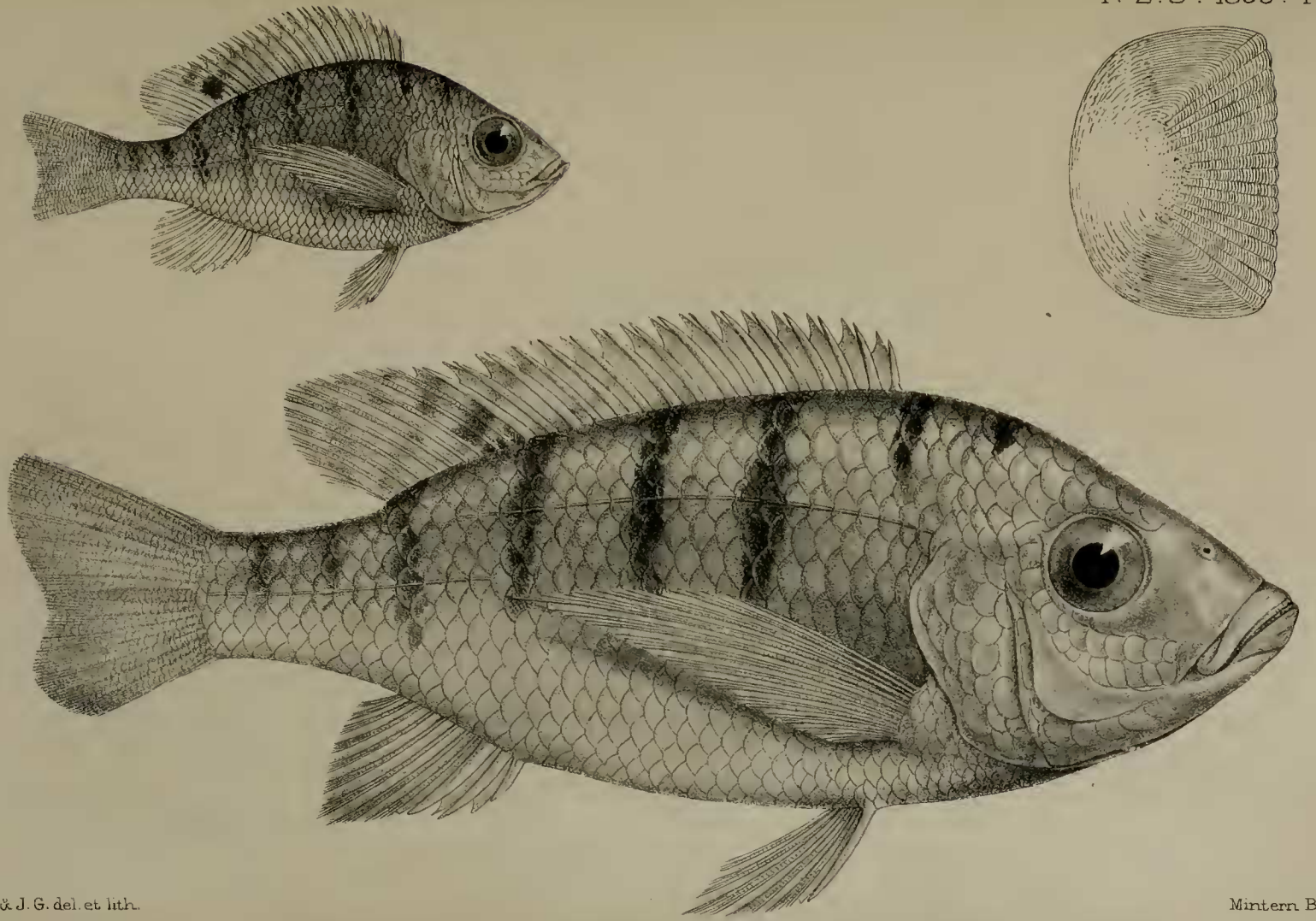
The following papers were read :—

1. Second Report on the Reptiles, Batrachians, and Fishes transmitted by Mr. H. H. Johnston, C.B., from British Central Africa. By Dr. A. Günther, F.R.S., V.P.Z.S.

[Received November 7, 1893.]

(Plates LIII.–LVII.)

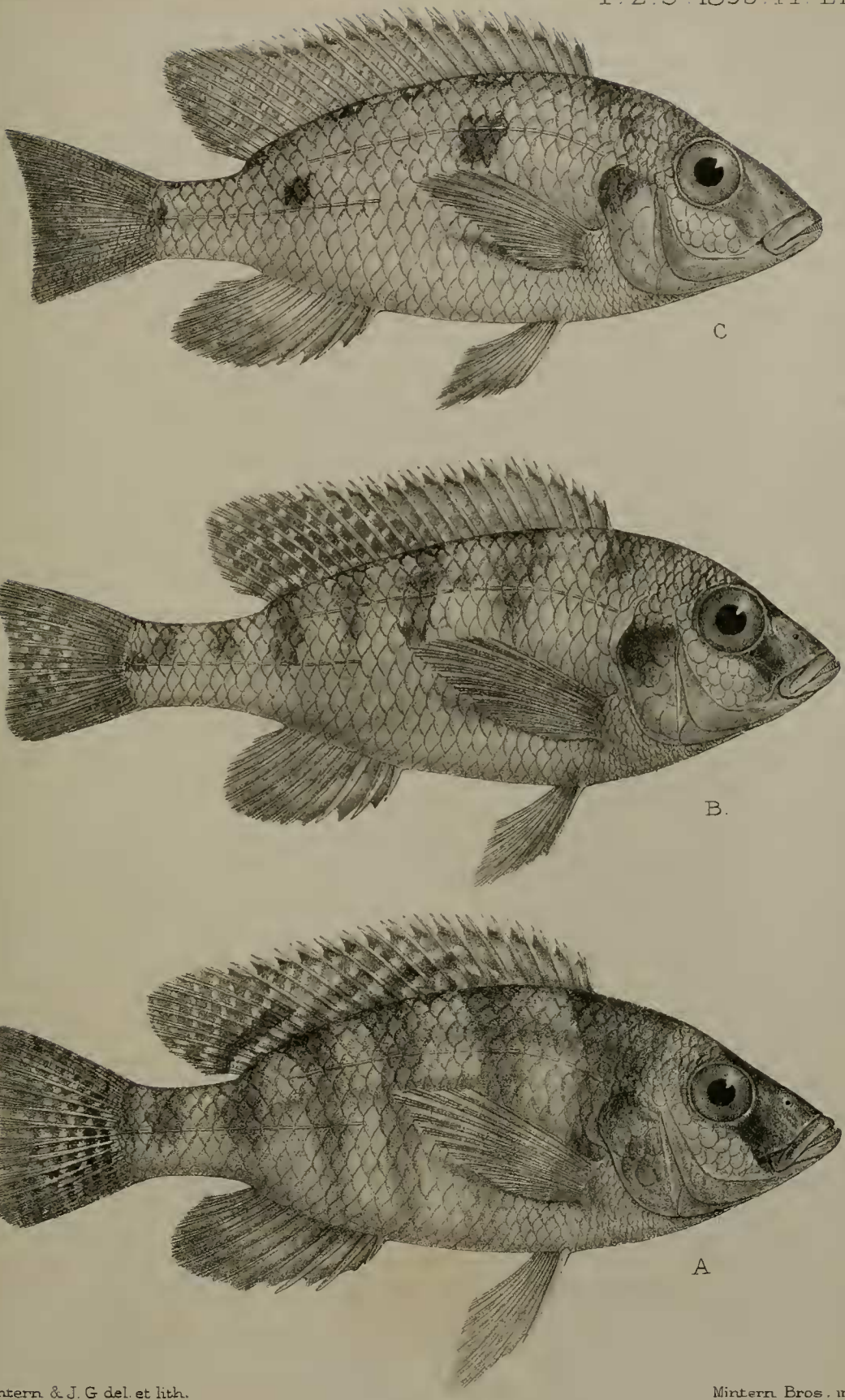
Since the publication of my first Report on this subject (see P. Z. S. 1892, p. 555) two more consignments have been received



R. Mintern & J. G. del. et lith.

Mintern Bros. imp.

CHROMIS SQUAMIPINNIS.

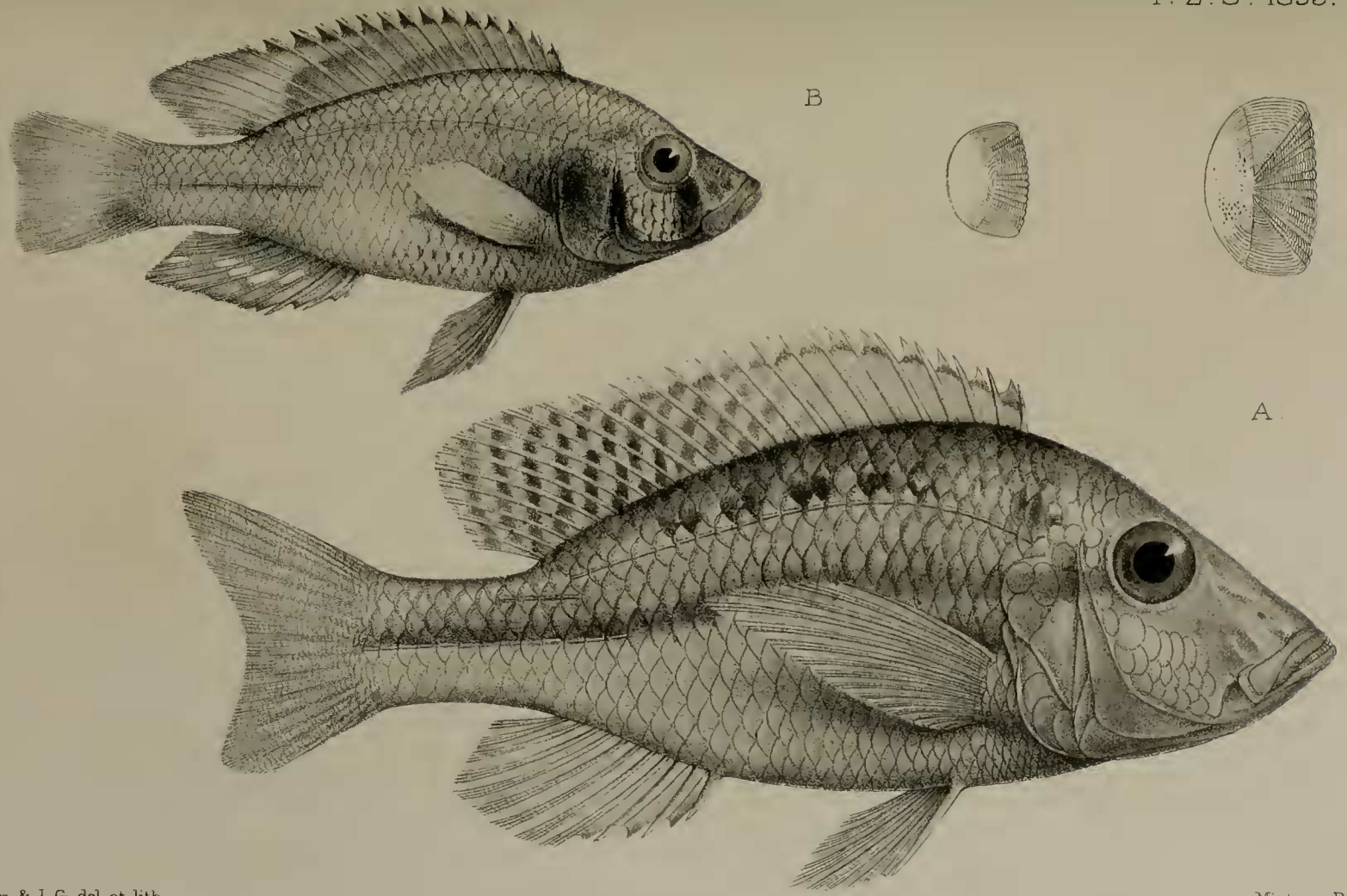


R. Mintern & J. G del. et lith.

Mintern Bros. imp.

CHROMIS.

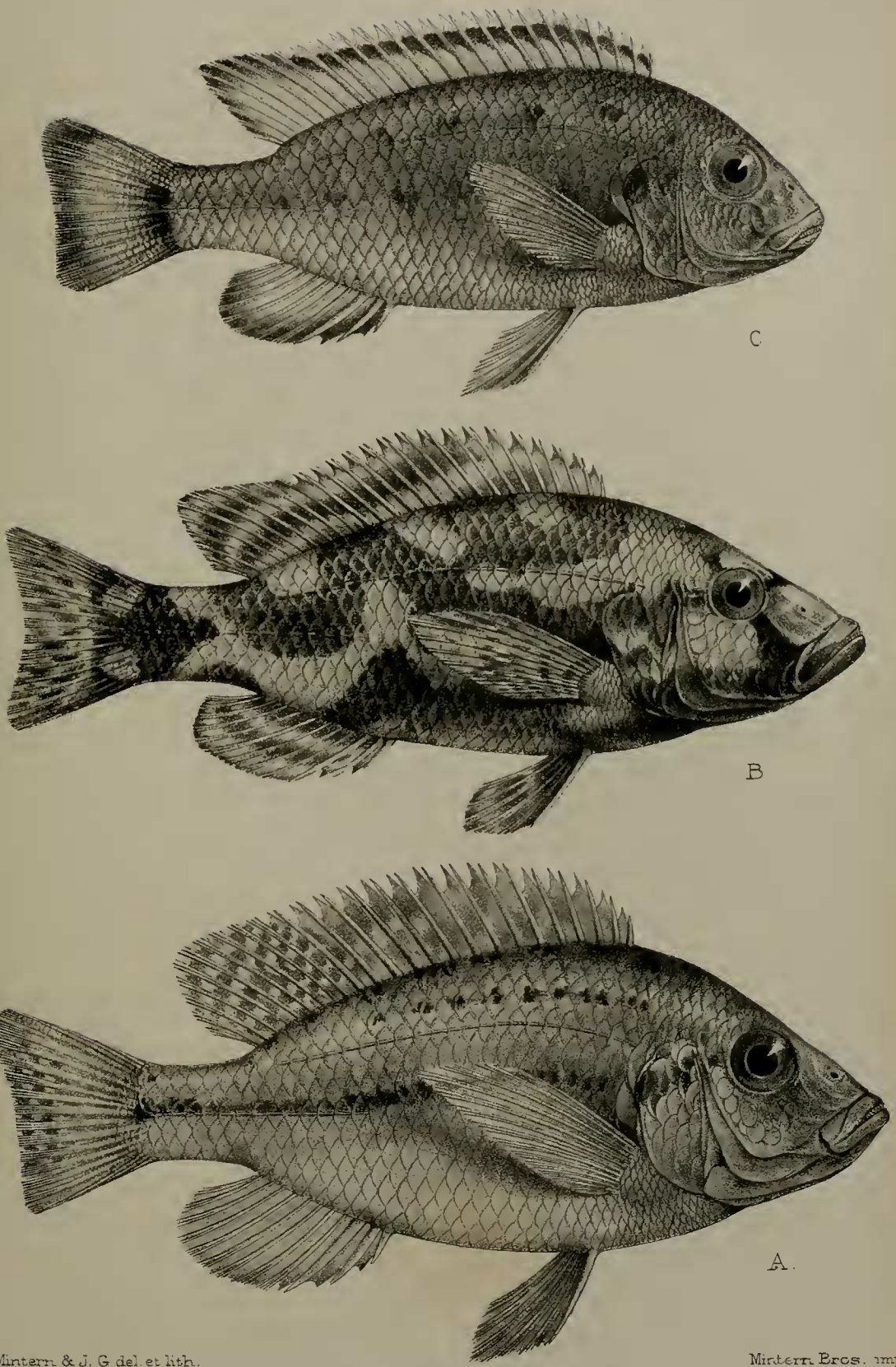
A. CH. JOHNSTONI B. CH. SUBOCULARIS C CH TETRASTIGMA.



R. Mintern & J. G. del. et lith.

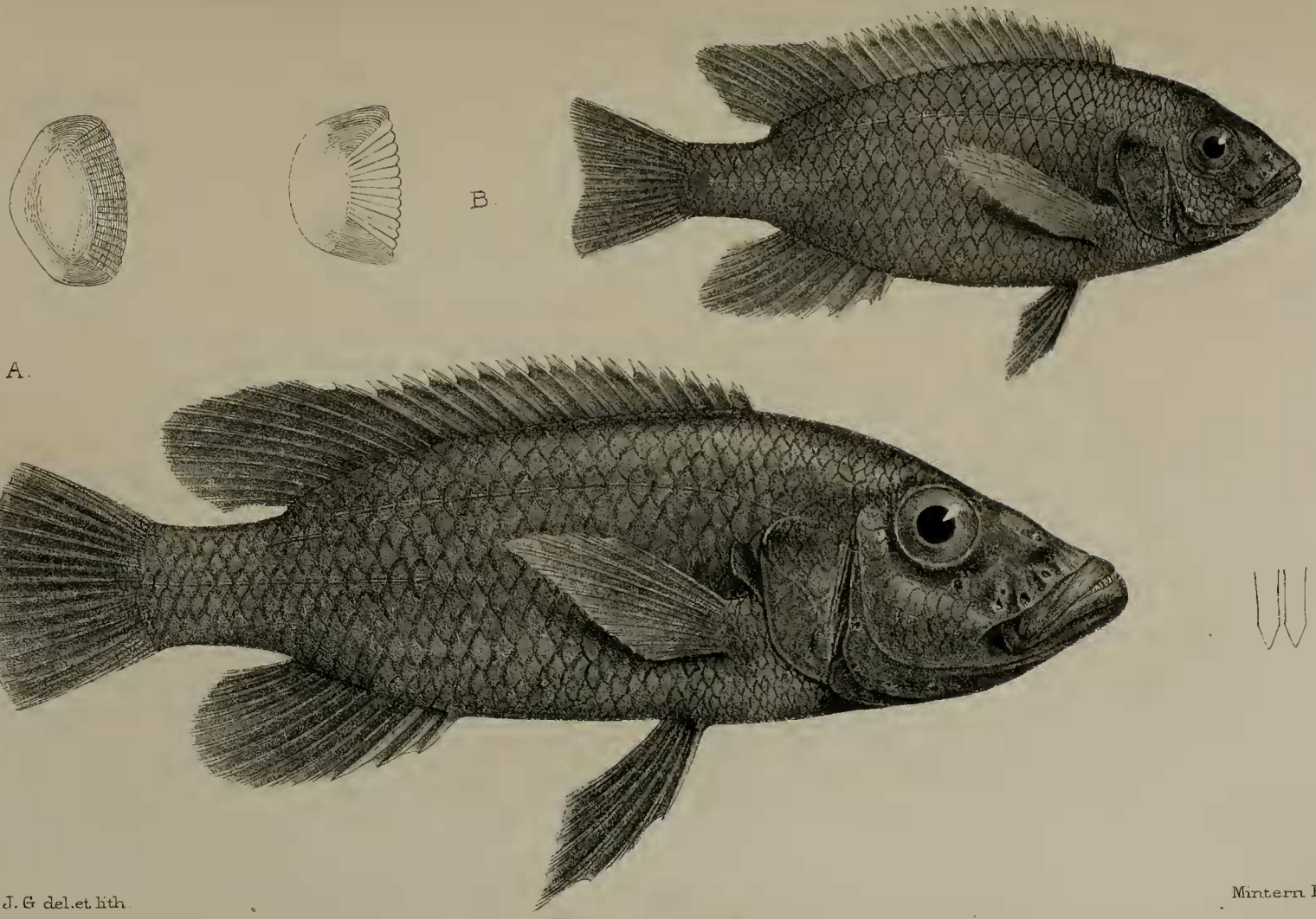
Mintern Bros. imp.

A. CHROMIS LETHRINUS. B. CHROMIS CALLIPTERUS.



R. Mintern & J. G. del. et lith. Mintern Bros. imp.

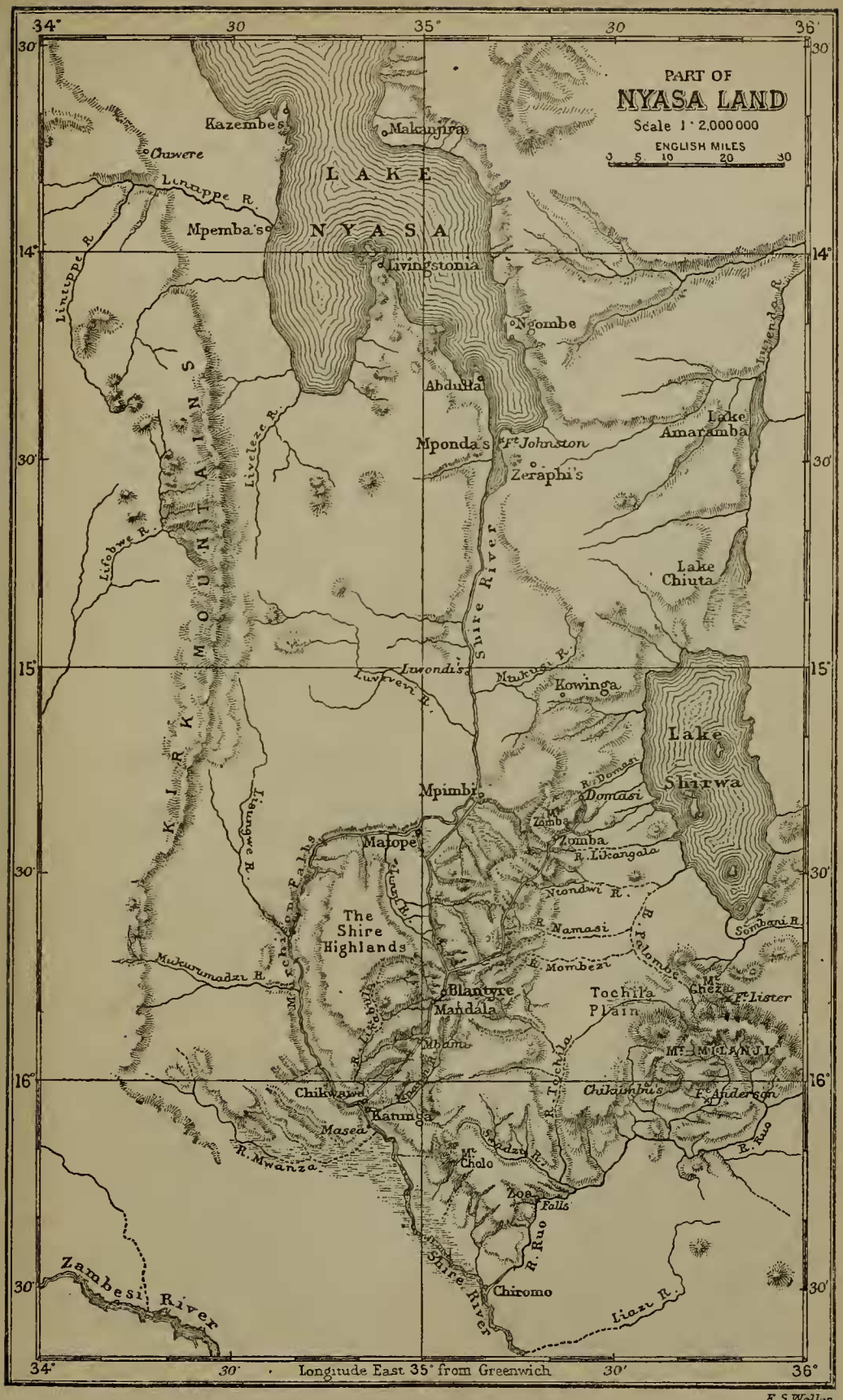
A. CHROMIS KIRKII. B. HEMICHROMIS LIVINGSTONII.
C. CHROMIS WILLIAMSI



R. Mintern & J. G. del. et lith.

Mintern Bros. imp.

A. HEMICHROMIS MODESTUS. B. HEMICHROMIS AFER.



F. S. Weller.

MAP OF SOUTHERN NYASALAND.

from Mr. Johnston through Mr. Sclater. The Reptiles and Batrachians, having been collected in nearly the same localities as those of the first consignment, represent the same species which were described in the first Report, but with the addition of several others new to the Nyasa district. They will be enumerated below.

The most important portion, however, of this consignment consists of Fishes from Lake Nyasa. Since the year 1864, when I described the skins collected and prepared by Livingstone's companion, Sir J. Kirk (see P. Z. S. 1864, p. 303), nothing has been done to advance our knowledge of the Fish Fauna of this Lake. The only specimens which have reached me were collected in 1891 by the Rev. J. A. Williams, who kindly presented them to the British Museum; they are noticed in the present report. The specimens collected by Mr. Whyte, the naturalist attached to Mr. Johnston's staff[1], are unfortunately of small, many of very small size; but they reveal the remarkable fact, which has also been observed in much smaller freshwater areas, like Lake Tiberias, that the genera *Chromis* and *Hemichromis* are represented in the same river-basin not by one or two, but by a considerable number of species closely allied to, but readily distinguishable from, each other. To judge from the manner in which these fishes were distributed in the collecting-jars, the various species inhabit the same localities.

To the list of species already given in my former report the following have to be added :—

Chelonians: *Cycloderma frenatum* (Ptrs.); *Sternothærus sinuatus* (Smith).

Lizards: *Lygosoma sundevalli* (Smith); *Gerrhosaurus flavigularis* (Wiegm.); *Hemidactylus mabouia* (Moreau); *Chamæleon dilepis* (Gray); *Chamæleon melleri* (Gray).

Snakes: *Coronella olivacea*, var. *dumerilii* (Gthr.); *Dasypeltis scabra* (L.); *Psammophis sibilans* (L.); *Psammophis sibilans*, var. *intermedia* (Fisch.); *Ahætulla neglecta* (Ptrs.); *Dryiophis oatesii* (Gthr.); *Naja nigricollis* (Rnhdt.); *Causus rhombeatus* (L.); *Clotho rhinoceros* (Schleg.).

Batrachians: *Rana johnstoni*, sp. n.; *Cassina senegalensis*

[1] [Mr. Alexander Whyte, F.Z.S., who fills the post of Naturalist and Horticulturist under Mr. Johnston in the Central African Administration, is resident at Zomba, the seat of the Administration, which is situated on the south-east slope of Mount Zomba, close to the Mlungusi Stream, and is therefore in the watershed of Lake Shirwa, *not* in that of the Zambesi (see the article on Routes and Districts in Southern Nyasaland by Lieut. B. L. Sclater, R.E., in the 'Geographical Journal,' vol. ii. p. 419, Nov. 1893). In November 1892, Mr. Whyte accompanied H.B.M. Commissioner in a journey to Fort Johnston, which is situated on the east bank of the Upper Shiré, about two miles below its exit from Lake Nyasa. It was upon this occasion that the collection of Fishes described by Dr. Günther in the present paper was made, as I find by reference to his letters. Fort Johnston, Zomba, and most of the other localities from which Mr. Johnston's various collections have been received are shown in the map (p. 617), which has been reprinted (with emendations) from that in the 'Geographical Journal' for 1893, p. 249.—P. L. S.]

(Smith); *Arthroleptis macrodactyla* (Blgr.); *Rappia cinctiventris* (Cope, = *citrina*, Gthr.); *Rappia nasuta* (Gthr.).

Fishes: *Chromis squamipinnis* (Gthr.); *Chromis subocularis*, sp. n.; *Chromis johnstoni*, sp. n.; *Chromis lethrinus*, sp. n.; *Chromis tetrastigma*, sp. n.; *Chromis callipterus*, sp. n.[1]; *Chromis kirki*, sp. n.; *Chromis williamsi*, sp. n.[1]; *Hemichromis intermedius* (Gthr.); *Hemichromis modestus*, sp. n.; *Hemichromis livingstonii*, sp. n.; *Hemichromis afer*, sp. n.; *Hemichromis longiceps* (Gthr.); *Bagrus meridionalis*, sp. n.; *Synodontis zambesensis* (Ptrs.)[1]; *Alestes imberi* (Ptrs.); *Mormyrus discorhynchus* (Ptrs.)[1]; *Mormyrops zambanenje* (Ptrs.)[1]; *Haplochilus johnstoni*, sp. n.; *Labeo mesops*, Gthr.[2]; *Barbus trimaculatus* (Ptrs.)[3]; *Engraulicypris pinguis* (g. et sp. n.)[1].

This addition raises the number of species of fishes now known from Lake Nyasa and the Shiré River to thirty-three, but the number actually inhabiting these waters may be safely estimated at thrice that figure at the very least.

I subjoin descriptions of the new species, with some notes on others previously known.

Rhampholeon brachyurus, Gthr. P. Z. S. 1892, p. 557.

This species was described in the first report from a female; Mr. Johnston has now sent a male, which does not essentially differ from the opposite sex.

Rhampholeon platyceps, Gthr. P. Z. S. 1892, p. 556.

This species was also described in the first report from a female, which, besides, was mutilated. The male now sent shows that the tail is really as short as represented (in outline) in the figure given of this species. The male has a very small skinny lobe at the end of the snout, and about six distant and inconspicuous tubercular projections along the median ridge of the back. It was obtained at Tshiromo.

Rhampholeo boettgeri, Pfeffer, Zool. Ergebn. Reise Stuhlmann, 1893; Rept. p. 8, Taf. i. figs. 6 and 7, may prove to be the same species.

Psammophylax variabilis, Gthr. P. Z. S. 1892, p. 557.

This Snake must be very useful as a destroyer of mice; two had examples of *Mus dolichurus* in their stomachs.

Dasypeltis scabra, L.

Common. The series of scales vary from 23 to 27. I doubt the specific distinctness of *D. palmarum*.

[1] Obtained by the Rev. J. A. Williams.

[2] Caught in the Upper Shiré River.

[3] This species has a distinct, unserrated, osseous spine, much stronger than the rays and stronger than is figured by Peters, who had one specimen only from the Lower Zambesi.

Ahætulla neglecta (Ptrs.).

Specimens were collected at Zomba and Milanji. Two of them showed broad irregular brown cross-bands on the anterior fourth of the trunk. The ovary contained only five eggs, ready for exclusion. Feeds on frogs.

Naja nigricollis, Rnhrdt.

This species would seem to show an extraordinary range in the number of rows of scales counted somewhat before the middle of the trunk. Peters mentions the number of 27; I myself have counted 25, 23 (twice), 21, 19; and now a large specimen obtained by Mr. Crawshay at Lake Mweru, of which he preserved the skin, has only 17 of these rows. It is black above, but shows the black cross-band on the hinder part of the throat. The temporal scute is divided by suture from the adjoining labial, as is characteristic for *N. nigricollis* and *N. tripudians*. The posterior pair of intermentalia are entirely separated from each other by intervening scales. I propose for this remarkable variety (if it be not regarded as a species) the name of *crawshayi*.

Clotho rhinoceros, Schleg.

Skin of a young River-jack from Lake Mweru, collected by Mr. Crawshay.

Rana johnstoni, sp. n.

Vomerine teeth in two slightly oblique short series, extending to behind the level of the posterior margin of the choanæ. Head rather broad, with the snout obtusely rounded and rather short; canthus rostralis indistinct; interorbital space rather broader than the upper eyelid; tympanum indistinct, one third the size of the eye. Fingers moderate, the first not extending beyond the second; toes moderate, almost entirely webbed; a single very small inner metatarsal tubercle. The tibio-tarsal articulation reaches to between the eye and the end of the snout. Skin smooth. Upper parts either uniform blackish, or olive coloured and marbled with black; lower parts dusky, throat marbled with brown.

Distance of snout from vent 45 millimetres; distance of the angles of the mouth 16 millimetres; length of hind limb 80 millimetres; length of foot, including metatarsus, 35 millimetres; length of fourth toe 24 millimetres.

Two specimens, obtained at Tshiromo in the month of November.

Arthroleptis macrodactyla, Blgr.

The single specimen is not in a good state of preservation, and its reference to this Gaboon species therefore requires further confirmation.

Rappia nasuta, Gthr.

The type came from Angola, but there cannot be any doubt

about its identity with a well-preserved example in the Nyasa collection.

Chromis squamipinnis. (Plate LIII. ad. et jr.)

Chromis squamipinnis, Günth. P. Z. S. 1864, p. 311.

D. $\frac{15-16}{10-11}$. A. $\frac{3}{9}$. L. lat. 33. L. transv. $\frac{4}{14}$.

Teeth very small, notched, brown at the tip, with the inner cusp longest; in young specimens about thirty-four, in old ones about forty on each side of the outer series of the upper jaw. Scales below the eye in two series; those of the body smooth and not ciliated. Forehead broad, flattish, its width being much more than the diameter of the eye. In old specimens the horizontal width of the præorbital equals the diameter of the eye, but is much less in young ones. The scaly part of the cheek is narrow, much narrower than the orbit. The two limbs of the præoperculum meet at a right angle. The height of the body is two fifths of the total length without caudal, the length of the head one third. The length of the longest dorsal spine equal to that of the postorbital portion of the head. Pectoral fin long, sometimes extending beyond the middle of the anal. Caudal densely covered with minute scales, which are visible even in young specimens. Greenish, shining silvery, with six or seven irregular black cross-bands, the foremost in the middle of the neck, the last on the free portion of the tail; the band below the origin of the soft dorsal is frequently continued into a spot on that fin.

This species seems to be the most common. I first described it from skins collected by Sir John Kirk, of which the largest was 12 inches long; Mr. Whyte now sends some specimens from 3 to 4 inches long.

The figure of the adult specimen is reduced to $\frac{2}{3}$ the natural size.

Chromis subocularis. (Plate LIV. fig. B.)

D. $\frac{15}{10}$. A. $\frac{3}{8}$. L. lat. 30. L. transv. $\frac{3\frac{1}{2}}{10}$.

Teeth deeply bicuspid, with the inner cusp longest; brown at the tip in a specimen $4\frac{1}{2}$ inches long; *twenty-three* on each side of the outer series of the upper jaw. Scales below the eye in three series. The diameter of the eye exceeds the width of the præorbital and the width of the interorbital space, which is flat, but is nearly equal to the depth of the scaly portion of the cheek. The two limbs of the præoperculum meet at nearly a right angle. The height of the body is nearly equal to the length of the head and one third of the total without caudal; the longest dorsal spine is the last, and less than one half of the length of the head. Pectoral fin extending to the origin of the anal. Scales smooth. Body with seven blackish cross-bands, which are rather irregular and do not descend to the lower half of the body; the first is in front of the dorsal and the last two on the caudal peduncle; a short black

streak from the eye to the angle of the mouth; the soft dorsal and caudal with alternate darker and lighter spots between the rays; anal not coloured.

Very young specimens, from 2 to $3\frac{1}{2}$ inches long, have the body of uniform coloration, but the suborbital band is present.

The largest specimen is $4\frac{1}{2}$ inches long.

Chromis johnstoni, sp. n. (Plate LIV. fig. A.)

D. $\frac{16}{10}$. A. $\frac{3}{8-9}$. L. lat. 30. L. transv. $\frac{4}{10}$.

Teeth distinctly bicuspid, with the inner cusp longest, brown at the tip in a specimen $4\frac{3}{4}$ inches long; *thirty* on each side of the outer series of the upper jaw. Scales below the eye in three series. The diameter of the eye equals the width of the præorbital and the depth of the scaly portion of the cheek, but exceeds the width of the interorbital space, which is convex. The angle formed by the præopercular limbs is very obtuse. The height of the body is nearly equal to the length of the head and one third of the total. The longest dorsal spine is the last, and less than one half of the length of the head. Pectoral fin extending to the origin of the anal. Scales smooth. Body with six blackish cross-bands, which descend to the lower half of the body; the first is in front of the dorsal, the fifth below the end of the dorsal, and the last on the caudal peduncle; a short black streak from the eye to the angle of the mouth; dorsal and caudal fins chequered with darker and lighter spots.

Only one specimen is sent, $4\frac{3}{4}$ inches long.

Chromis lethrinus, sp. n. (Plate LV. fig. A.)

D. $\frac{15}{10}$. A. $\frac{3}{8}$. L. lat. 33. L. transv. $\frac{3\frac{1}{2}}{10}$.

Teeth very small, each with two short, subequal, brownish cusps; thirty-seven on each side of the outer series of the upper jaw. Scales below the eye in three series. The diameter of the eye is less than the width of the præorbital and equal to the depth of the scaly portion of the cheek and to the width of the interorbital space, which is flat. The angle formed by the præopercular limbs is nearly a right one. The height of the body is nearly equal to the length of the head and rather more than one third of the total (without caudal). The longest dorsal spine is the last and less than one half of the length of the head. Pectoral fin extending a little beyond the origin of the anal. Caudal covered with minute scales. Scales smooth. Body with a straight blackish longitudinal band running from the eye above the caudal portion of the lateral line; back with transverse blackish spots; dorsal fin with oblique blackish bands; caudal and anal without ornamentation.

Only one specimen is sent, $5\frac{3}{4}$ inches long.

Chromis tetrastigma, sp. n. (Plate LIV. fig. C.)

D. $\frac{15}{10}$. A. $\frac{3}{8}$. L. lat. 30. L. transv. $\frac{3\frac{1}{2}}{10}$.

Teeth distinctly bicuspid, brown at the tip, the inner cusps being larger than the outer; from twenty-eight to thirty-two on each side of the outer series of the upper jaw. Scales below the eye in three series. In a specimen $4\frac{1}{2}$ inches long the diameter of the eye exceeds the width of the præorbital, the depth of the scaly portion of the cheek, and the width of the interorbital space, which is flat. The angle formed by the præopercular limbs is nearly a right one. The height of the body is rather more than the length of the head, which is one third of the total (without caudal). The length of the last dorsal spine is two fifths of that of the head. Pectoral fin extending to the origin of the anal. The upper and lower caudal rays covered with scales. Scales smooth. A series of four large black spots on the body—the first on the operculum, the second on the lateral line opposite to the ninth and tenth dorsal spines, the third on the beginning of the lower lateral line, the fourth on the root of the caudal fin. Vertical and ventral fins blackish, the dorsal with numerous ocelli.

Several specimens, of which the largest is $4\frac{1}{2}$ inches long, are sent from Zomba and from Fort Johnston.

Chromis callipterus, sp. n. (Plate LV. fig. B.)

D. $\frac{14}{9}$. A. $\frac{3}{7}$. L. lat. 27–28. L. transv. $\frac{4-5}{10}$.

Teeth distinctly bicuspid, the cusps being short, subequal, and brownish; from twenty-seven to thirty-two (in very young specimens twenty-two) teeth on each side of the outer series of the upper jaw. Scales below the eye in three series. In a specimen $5\frac{1}{2}$ inches long the diameter of the eye equals the width of the præorbital and of the interorbital space, but is a little less than the depth of the scaly portion of the cheek. The angle formed by the præopercular limbs is a right one. The height of the body is rather more than the length of the head, which is one third of the total (without caudal). The longest dorsal spine is the last and rather less than one half of the length of the head. Pectoral fin extending to the origin of the anal; caudal more or less scaleless. Scales roughened, with minute projections on the margin. Body dark-coloured, with the vertical fins blackish, the anal being ornamented by a series of large milky-white ocelli from two to four in number; in our largest specimen also the dorsal fin is ornamented with round light-coloured spots. A black band running from the eye to the angle of the mouth seems to be constant.

The largest specimen is $5\frac{1}{2}$ inches long, and was sent by the Rev. J. A. Williams; smaller specimens from Zomba are in the Johnston collection.

Chromis kirkii, sp. n. (Plate LVI. fig. A.)

D. $\frac{15}{9}$. A. $\frac{3}{8}$. L. lat. 29. L. transv. $\frac{5}{10}$.

Teeth distinctly bicuspid, each with two subequal brownish cusps, from seventeen to nineteen on each side of the outer series of the upper jaw. Scales below the eye very thin, in three rather irregular series. In a specimen $4\frac{1}{2}$ inches long the diameter of the eye is rather more than the width of the præorbital or than the depth of the scaly portion of the cheek, but equal to the width of the interorbital space, which is flat. The angle formed by the præopercular limbs is an obtuse one. The height of the body is two fifths the length of the head, one third of the total (without caudal). The longest dorsal spine is not quite one half of the length of the head. Pectoral fin extending to, or a little beyond, the origin of the anal fin. Caudal fin covered with minute scales. Scales rough, with minute projections on the margin. A rather narrow straight black stripe runs from the opercular spot to the end of the lateral line; another similar band, but broken up into spots, runs along the side of the back, and is absent in very young individuals. The soft dorsal with oblique, alternate, lighter and darker bands. No band across the præorbital.

Several specimens, the largest being $4\frac{1}{2}$ inches in length.

Chromis williamsi, sp. n. (Plate LVI. fig. C.)

D. $\frac{17}{8}$. A. $\frac{3}{7}$. L. lat. 28. L. transv. $\frac{7}{12}$.

Teeth deeply bicuspid, brown at the tip, the inner cusps being much larger than the outer; twenty-six or twenty-seven on each side of the outer series of the upper jaw. Scales below the eye in four series; the scales on the neck between the anterior dorsal spines and the beginning of the lateral line are remarkably small. In a specimen $4\frac{1}{3}$ inches long the diameter of the eye exceeds the width of the præorbital, is equal to the depth of the scaly portion of the cheek and less than the width of the interorbital space, which is rather convex. The angle formed by the præopercular limbs is a right one. The height of the body is a little more than the length of the head, which is one third of the total (without caudal). The length of the last dorsal spine is less than one half of that of the head. Pectoral fin not quite reaching the vent; caudal fin covered with scales. Scales rough, without spines on the margin. Body nearly uniform dark-coloured, with a black spot on the end of the operculum, and another at the root of the caudal fin; vertical fins blackish, the dorsal with a broad black margin and the anal with a small milky-white spot between the fifth and sixth rays.

A single specimen, $4\frac{1}{3}$ inches long, obtained by the Rev. J. A. Williams.

Hemichromis modestus, sp. n. (Plate LVII. fig. A.)

D. $\frac{16}{10}$. A. $\frac{3}{9}$. L. lat. 29. L. transv. $\frac{5}{12}$.

All the teeth are conical, only one or two showing traces of an additional cusp, thirty-four on each side of the outer series of the upper jaw. Scales below the eye in four rather irregular series; scales on the neck and below the anterior dorsal spines much smaller than those of the body. In a specimen 6 inches long the diameter of the eye equals the width of the præorbital and the depth of the scaly portion of the cheek, but is less than the width of the interorbital space, which is convex. The angle formed by the præopercular limbs is a right one. Snout considerably produced, with the lower jaw strongly projecting beyond the upper, rather longer than the postorbital portion of the head. The height of the body is less than one third, the length of the head considerably more than one third of the total length (without caudal). Dorsal spines rather short, of moderate strength, the longest being one third of the length of the head. Pectoral fin reaching to the vent. Body uniform brownish black, fins black.

Some of the gill-rakers are T- or hammer-shaped.

A single specimen, 6 inches long, was obtained by the Rev. J. A. Williams.

Hemichromis livingstonii, sp. n. (Plate LVI. fig. B.)

D. $\frac{16}{10}$. A. $\frac{3}{9}$. L. lat. 32. L. transv. $\frac{7}{12}$.

Teeth conical, but a few show traces of an additional cusp, twenty-six on each side of the outer series of the upper jaw. Scales below the eye very thin, in five rather irregular series; those on the neck and anterior part of the back much smaller than those of the body. In a specimen 5 inches long the diameter of the eye is less than the depth of the scaly portion of the cheek, but equals the width of the præorbital and of the interorbital space, which is convex. The angle formed by the præopercular limbs is a right one. Snout moderately produced, equal to the postorbital portion of the head, the lower jaw projecting but little beyond the upper. The height of the body is a little less than the length of the head, which is nearly one third of the total (without caudal). Dorsal spines of moderate strength and length, the longest being two fifths of the length of the head. Pectoral fin reaching to the anal. Body largely and irregularly marbled with black and silvery; head ornamented with several black bands, one from the eye to the angle of the mouth, merging into the black coloration of the lower parts, another band from the eye over the operculum, a third across the forehead, and a fourth across the foremost part of the neck; dorsal and caudal marbled with lighter and darker, ventral and anal black.

None of the gill-rakers are hammer-shaped.

A single specimen, 5 inches long, is in the Johnston collection.

Hemichromis afer, sp. n. (Plate LVII. fig. B.)

D. $\frac{16}{9}$. A. $\frac{3}{8}$. L. lat. 30. L. transv. $\frac{5}{10}$.

Teeth conical, eighteen on each side of the outer series of the upper jaw. Scales below the eye in four rather irregular series; those on the neck and anterior part of the back much smaller than those of the body. In a specimen 4 inches long the diameter of the eye equals the width of the præorbital and the depth of the scaly portion of the cheek, but is less than the width of the interorbital space, which is convex. The angle formed by the præopercular limbs is a right one. Snout short and obtuse, shorter than the postorbital portion of the head, the lower jaw not projecting beyond the upper. The height of the body is somewhat more than the length of the head and equal to one third of the total (without caudal). Dorsal spines of moderate strength and length, the longest being about two fifths of the length of the eye. Pectoral fin reaching to the vent. Body uniform more or less dark brown, a spot on the end of the opercle and all the fins deep black.

Gill-rakers short, some of them T- or hammer-shaped.

Two specimens, the longer 4 inches long, were collected by the Rev. J. A. Williams.

Bagrus meridionalis, sp. n.

This species is closely allied to *B. bayad*, agreeing with this Nilotic form in the shape and configuration of the head and the number of fin-rays, but the dorsal and pectoral spines are much weaker, scarcely stronger than the rays; the maxillary barbels are shorter, only about as long as the head; and the adipose fin occupies a much shorter space of the back, its distance from the dorsal fin being equal to the length of the latter.

The dry skin of a specimen $22\frac{1}{2}$ inches long has been sent by Mr. Johnston from the Upper Shiré River; of course, it would occur also in the Lake itself, and it probably reaches to a very considerable size, like its congeners.

Engraulicypris, g. n. Cyprin.

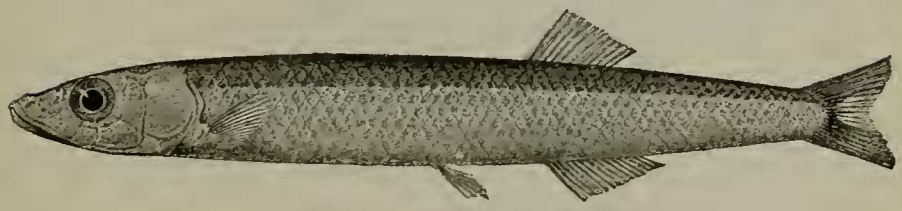
Shape of the head and body elongated, cylindrical like that of an Anchovy. Scales of moderate size, deciduous. Lateral line? Dorsal fin short, with less than nine branched rays, opposite to the commencement of the anal. Anal fin with about fourteen rays. Snout compressed, with the mouth of moderate width, lateral; the upper jaw almost entirely hidden below the large præorbital. Suborbitals covering nearly the entire cheek. Gill-rakers very slender. Pharyngeal teeth in a double series, pointed.

Engraulicypris pinguis, sp. n.

D. 11. A. 14. L. transv. 9 or 10.

Body very low, subcylindrical, its depth being one seventh or one eighth of the total length without caudal; the length of the

head is contained four times and one third in it. Eye large, shorter than the snout, and one fourth of the length of the head, occupying a position somewhat anterior to the middle of the head, The snout is pointed, with the mouth resembling that of a Clupeoid, the jaws having sharp margins, but being toothless; lower jaw not projecting when the mouth is closed, but provided with a short symphysial hook; bones of the suborbital ring, and particularly the præorbital, dilated. Head flat above; interorbital space rather



Engraulicypris pinguis.

narrower than the orbit. All the fins are short and feeble. The ventrals inserted somewhat nearer to the root of the caudal fin than to the end of the snout. The first dorsal ray is somewhat in advance of the first anal ray and nearer to the root of the caudal than to the gill-opening. Caudal emarginate.

All the scales are lost, but from the impressions of the skin it would appear that there are nine or ten scales in a transverse series below the origin of the dorsal fin.

Back dark bluish green, this colour being sharply defined from the silvery of the sides and lower parts; sides of the head bright silvery. The middle of the caudal fin is blackish with whitish centre.

Two specimens, 4 inches long, in bad condition, are sent by the Rev. J. A. Williams. I cannot help thinking that this fish, if it occurs in any great numbers and is easy of capture, might be preserved in a way similar to Anchovies and would form a useful addition to the food of the European community.

Haplochilus johnstoni, sp. n.

D. 7. A. 12–13. L. lat. 29. L. transv. 7.

The height of the body is one fourth or one fifth of the total length, without caudal; the length of the head a little less than one fourth. Head compressed; snout somewhat depressed; lower jaw projecting beyond the upper. The width of the interorbital space is less than one half of the length of the head. The diameter of the eye equals the length of the snout, and is a little less than one third of the length of the head. The origin of the dorsal fin is twice as distant from the eye as from the root of the caudal, and corresponds to the seventeenth scale of the lateral line or to the ninth anal ray. Pectoral fin extending beyond the root of the ventral. None of the fins elongate. Coloration of specimens in spirit uniform reddish olive; a fine bluish line runs along the scales of the lateral line.

Several specimens are sent from Fort Johnston; they were collected in November; their length is from 18 to 20 lines.

Allied to *Haplochilus petersi* (Sauvage), but differing in various particulars.

EXPLANATION OF THE PLATES.

PLATE LIII.

Chromis squamipinnis, p. 621.

PLATE LIV.

Fig. A. *Chromis johnstoni*, p. 622.
B. *Chromis subocularis*, p. 621.
C. *Chromis tetrastigma*, p. 623.

PLATE LV.

Fig. A. *Chromis lethrinus*, p. 622.
B. *Chromis callipterus*, p. 623.

PLATE LVI.

Fig. A. *Chromis kirki*, p. 624.
B. *Hemichromis livingstonii*, p. 625.
C. *Chromis williamsi*, p. 624.

PLATE LVII.

Fig. A. *Hemichromis modestus*, p. 625.
B. *Hemichromis afer*, p. 626.

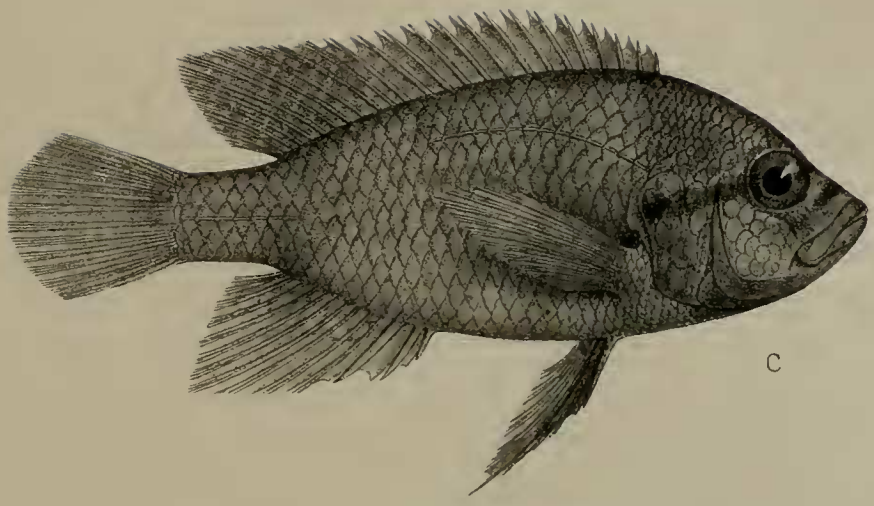
2. Descriptions of the Reptiles and Fishes collected by Mr. E. Coode-Hore on Lake Tanganyika. By Dr. A. GÜNTHER, F.R.S., V.P.Z.S.

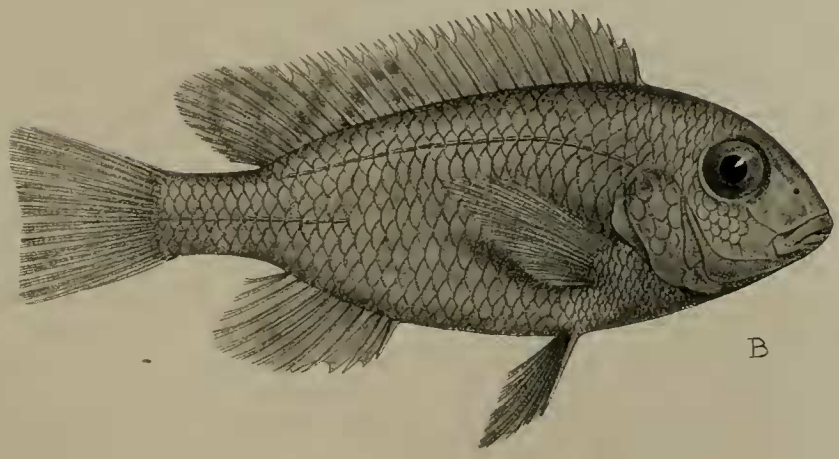
[Received November 7, 1893.]

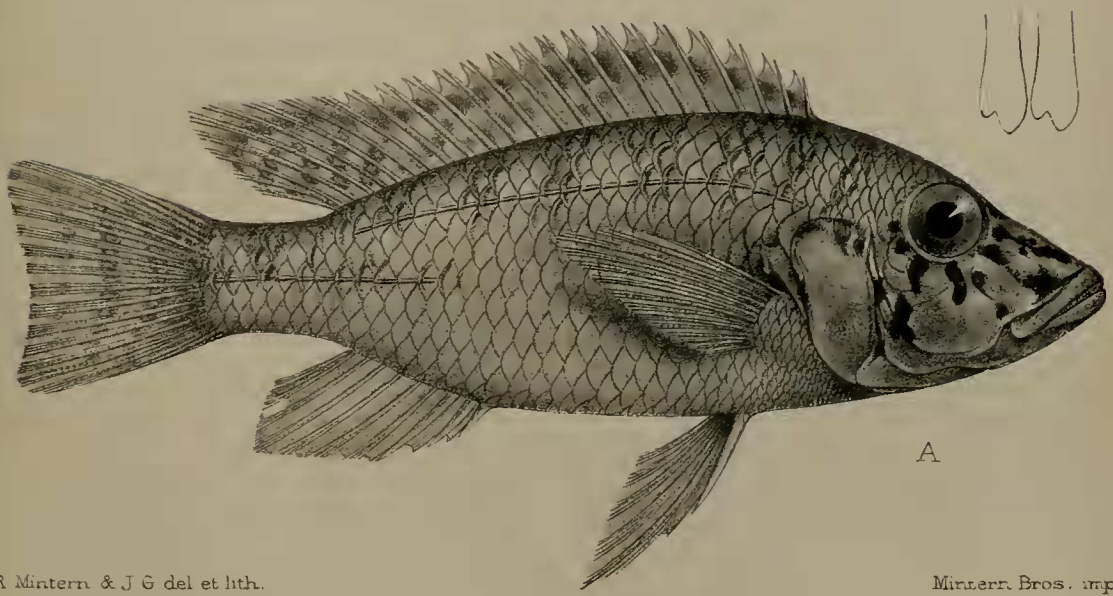
(Plate LVIII.)

Mr. Coode-Hore, who was resident for several years on the shores of Lake Tanganyika, brought home in 1889 a small collection of Snakes and Fishes. The specimens had greatly suffered during the long voyage to England, but some of them were in a sufficiently good state of preservation to be acquired for the British Museum and to be described here. I have deferred an account of them in the hope of seeing them supplemented by subsequent collections; but as it seems desirable to work them out in comparison with those from Lake Nyasa and other parts of Eastern Equatorial Africa, I will not allow the present occasion to pass without giving an account of them.

The discovery of two species of *Mastacembelus*, connecting the Asiatic species with the West African, is only one of the interesting facts which a more extended investigation of the Fish-fauna of this remarkable lake is sure to reveal.







R. Mintern & J. G. del et lith. Mintern Bros. imp.

CHROMIS.

A. CH. HOREI. B. CH. DIAGRAMMA. C. CH. BURTONI.

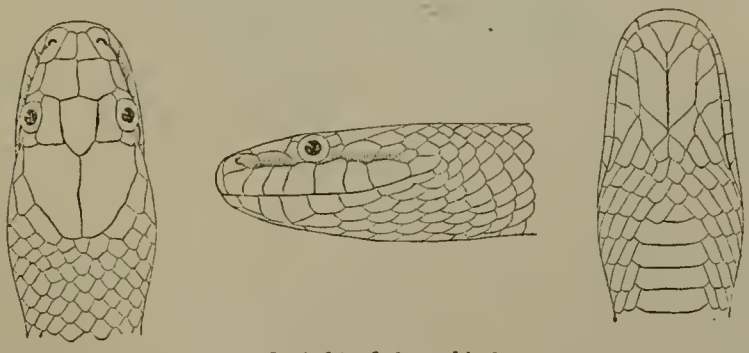
GLYPHOLYCUS, g. n. Lycodont.

Allied to *Boodon*, but with the dentition of *Lamprophis*, the maxillary teeth (about eighteen in number) being placed in a continuous series, and the anterior and middle ones being longer and stronger than the posterior; anterior mandibulary teeth stronger than the following. Sides of the head with a deep longitudinal groove or fold which separates the series of upper labials from the shields above. Head rather small and depressed; eyes small, with round pupil; body not compressed; scales smooth, in twenty-one or twenty-three rows; anal entire; subcaudals in two rows; nasal semi-divided; one loreal; anterior frontals pointed in front.

GLYPHOLYCUS BICOLOR, sp. n.

Vertical shield rather small, not much larger than the supra-ocular; occipital as long as the vertical and posterior frontal together; eight upper labial shields, of which the fourth enters the orbit; rostral shield reaching the upper surface of the head; loreal elongate, one anterior ocular not reaching the upper surface

Fig. 1.



Head of *Glypholycus bicolor*.

of the head; two posterior oculars; temporals 1+2+3; ventrals 163; subcaudals 56–72. Upper parts uniform brownish lead-coloured; lower parts and the two outer series of scales whitish; a brownish line along the meeting edges of the subcaudals.

Several specimens, of which one measures 26 inches, the tail taking $5\frac{1}{2}$.

MASTACEMBELUS TANGANICÆ, sp. n.

D. 33/56. C. 12. A. 2/61.

Trunk and tail short and compressed, its greatest depth being contained twice and a fourth in the length of the head. Rostral appendage very short. Vertical fins continuous, the length of the tail being but little more than two fifths of that of the head and trunk together.

Dorsal spines short, the distance of the foremost from the operculum being scarcely half the length of the head. Length of

the head one third of that of the trunk. Coloration either uniform brownish, or light coloured with numerous narrow brown cross-bands.

Several specimens, not in a good state of preservation, of which the largest is $6\frac{1}{2}$ inches long.

Mastacembelus ophidium, sp. n.

D. 31–32/103. C. 7. A. 1/116.

Body exceedingly slender, subcylindrical, its depth being one third of the length of the head. Rostral appendage very short. Vertical fins continuous, the vent being much nearer to the end of the snout than to the caudal fin. Dorsal spines short and feeble, the distance of the foremost from the operculum being only half the length of the head. Length of the head one third of that of the trunk. Scales minute. Coloration apparently uniform brownish.

Several specimens, not in a good state preservation, of which the largest is $11\frac{1}{2}$ inches long.

Chromis horei, sp. n. (Plate LVIII. fig. A.)

D. $\frac{16}{8}$. A. $\frac{3}{6}$. L. lat. 28. L. transv. $\frac{4}{9}$.

Teeth distinctly bicuspid, the cusps being subequal and slightly tinged with brown; from twenty-eight to thirty-one on each side of the outer series of the upper jaw. Cheeks naked or only with a few extremely thin scales. In a specimen nearly 5 inches long the diameter of the eye is nearly equal to the depth of the soft part of the cheek and a little less than the width of the præorbital and of the interorbital space, which is flat. The angle formed by the præopercular limbs is a right one. The height of the body is somewhat less than the length of the head and one third of the total (without caudal). The longest dorsal spine is the last and is two fifths of the length of the head. Pectoral fin extending to, or nearly to, the origin of the anal. Caudal scaleless. Scales rough, some with the margins ciliated. Body light greenish, with more or less conspicuous incomplete brownish cross-bands on the upper part of the body. The largest specimen has the cheek and snout ornamented with irregular deep brown spots; the soft dorsal and the caudal fin with scattered ocelli; a milky-white spot between the last two anal rays.

Three specimens, the largest $4\frac{3}{4}$ inches long.

Chromis tanganicæ, sp. n.

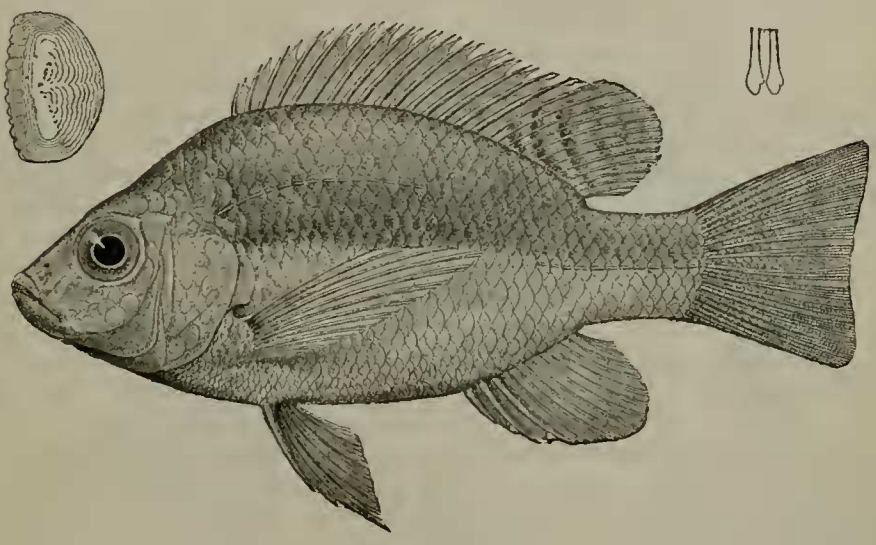
D. $\frac{16}{11-12}$. A. $\frac{3}{9-10}$. L. lat. 32. L. transv. $\frac{4}{6 \text{ \& } x \text{ small ones.}}$

Allied to *C. squamipinnis*.

Teeth small, with an obliquely dilated and notched apex; thirty on each side of the outer series of the upper jaw; scales below the eye in three series; in a specimen nearly 4 inches long the diameter of the eye exceeds the width of the præorbital and the depth

of the scaly portion of the cheek, but is less than the width of the interorbital space, which is nearly flat. The two limbs of the præoperculum meet at a right angle; the height of the body is contained twice and a fourth in the total (without caudal), the length of the head twice and four fifths; the longest dorsal spine

Fig. 2.



Chromis tanganicæ.

is less than one half of the length of the head. Caudal scaleless. Pectoral fin extending beyond the origin of the anal. Scales with concentric rough undulating ridges. Coloration uniform greenish with silvery reflections.

Three specimens.

Chromis burtoni, sp. n. (Plate LVIII. fig. C.)

D. $\frac{14}{11}$. A. $\frac{3}{9}$. L. lat. 27. L. transv. $\frac{3\frac{1}{2}}{9}$.

Teeth small, each with a small outer cusp, twenty-eight on each side of the outer series of the upper jaw. Scales below the eye in four or five series. In a specimen nearly 4 inches long the diameter of the eye equals the width of the præorbital and of the interorbital space, which is slightly convex transversely, but has a concave longitudinal profile; the depth of the scaly portion of the cheek is distinctly more than the width of the orbit. The angle formed by the præopercular limbs is a right one. The height of the body is rather more than the length of the head, which is one third of the total (without caudal). The length of the last dorsal spine is two fifths of that of the head; caudal with convex

posterior margin; pectoral fin extending to the origin of the anal. Scales rough, apparently uniform greenish, with a blackish spot on the end of the operculum; two narrow blackish bars across the upper surface of the snout; the soft dorsal with a row of rounded darker spots behind each ray.

One specimen.

CHROMIS DIAGRAMMA, sp. n. (Plate LVIII. fig. B.)

D. $\frac{17-18}{10}$. A. $\frac{3}{7}$. L. lat. 30. L. transv. $\frac{3\frac{1}{2}}{7 \text{ \& } x \text{ very small ones.}}$

This species has the upper profile of the head descending in a curve, reminding one of *Diagramma*. Teeth bicuspid, the inner cusp being the longer and brown; twenty-eight on each side of the outer series of the upper jaw. Scales below the eye in four series. In a specimen $3\frac{3}{4}$ inches long the diameter of the eye equals the width of the præorbital and the depth of the scaly portion of the cheek, but is less than the width of the interorbital space, which is convex. The angle formed by the præopercular limbs is a right one. The height of the body is rather more, and the length of the head less, than one third of the total (without caudal). The length of the last dorsal spine is two fifths of that of the head; caudal scaleless, with vertical posterior margin; pectoral fin extending to or nearly to the origin of the anal. Scales rough, with minute spines on the margin. The coloration seems to be uniform greenish, in the smaller specimens with indistinct narrow darker cross-bands.

Three specimens, the largest of which is $3\frac{3}{4}$ inches long.

EXPLANATION OF PLATE LVIII.

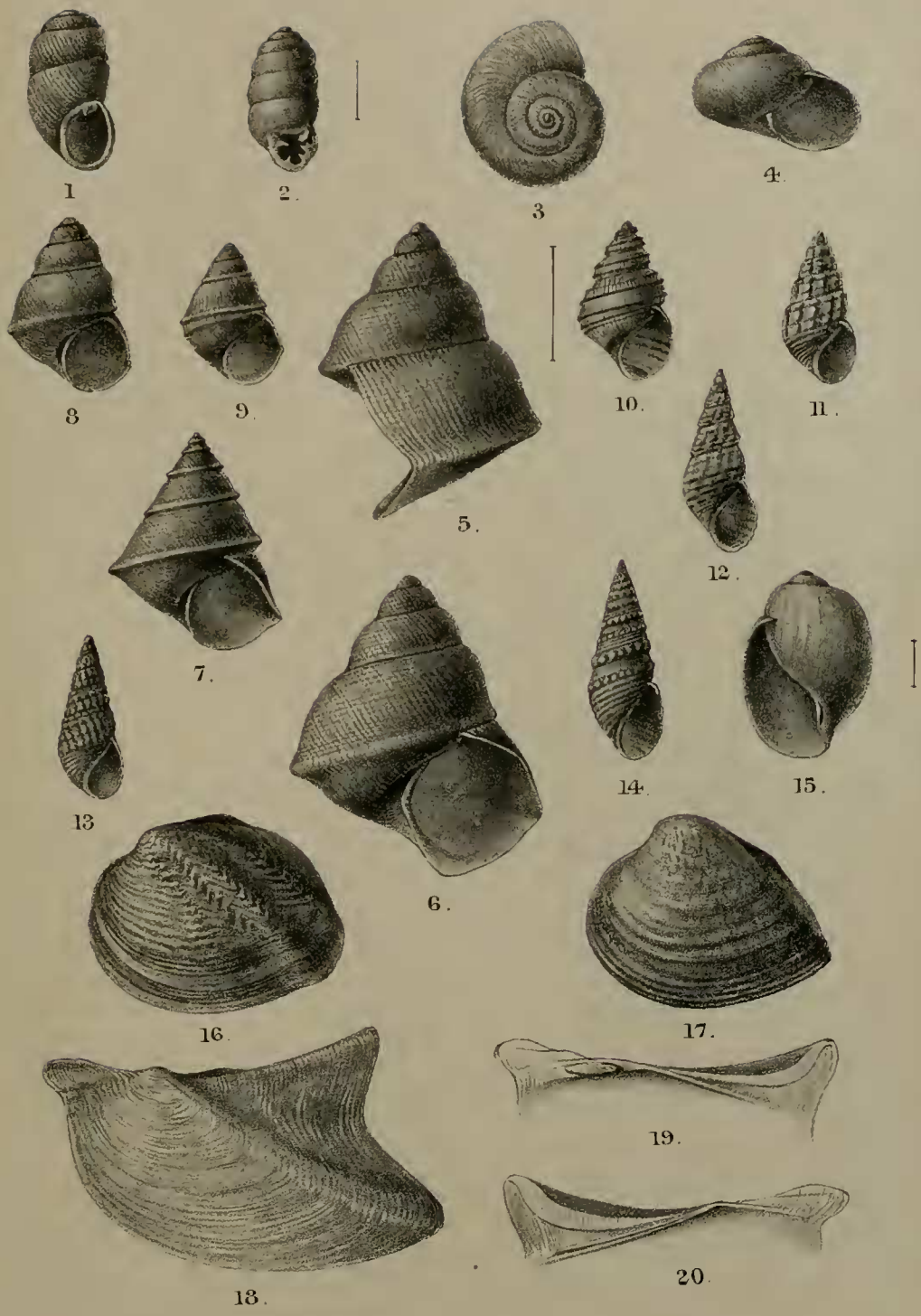
Fig. A. *Chromis horei*, p. 630.
B. *Chromis diagramma*, p. 632.
C. *Chromis burtoni*, p. 631.

3. On a Collection of Land and Freshwater Shells transmitted by Mr. H. H. Johnston, C.B., from British Central Africa. By EDGAR A. SMITH.

[Received August 28, 1893.]

(Plate LIX.)

The specimens comprised in this collection were obtained partly by Mr. R. Crawshay at Lake Mweru, Lake Tanganyika, and on the northern part of Lake Nyasa, and partly by Mr. A. Whyte at the southern end of the last-mentioned lake. They have been presented to the British Museum by H. H. Johnston, Esq., C.B., H.M. Commissioner in British Central Africa, to whom that insti-



J. Green del. et lith. Mintern Bros. imp.

SHELLS FROM BRITISH CENTRAL AFRICA.


BRITISH MUSEUM
NATURAL HISTORY.
22
SD

tution has been indebted on previous occasions for valuable collections from the Cameroons and the neighbourhood of Mount Kilimanjaro.

The most interesting specimens of the present collection are those obtained at Lake Mweru, a locality from which no Mollusca have as yet been recorded. This lake lies to the south-west of Lake Tanganyika, with which, however, it has no connection, as would be presumed by the difference of the Molluscan faunas so far as they are at present known. All the species from Lake Mweru are undescribed with one exception, and this appears to be a dead worn example of *Lanistes ovum*. The other species include two forms of *Viviparus*, two *Cleopatræ*, three *Melaniæ*, a very remarkable winged *Unio*, and examples of two or three other species of that genus, but represented by specimens too young or too worn to be determined.

Forms of all these genera occur in Tanganyika, and one of the species belongs to that group of *Viviparus* which, characterized by the aperture being somewhat effuse anteriorly and the outer lip sinuated, was described by the writer in these 'Proceedings' for 1880 as a new genus from Tanganyika, under the name of *Neothauma*.

1. Ennea johnstoni. (Plate LIX. fig. 1.)

Testa elongata, cylindracea, crassiuscula, rimata, flavo-viridis, parum nitida; anfractus 6, *convexiusculi, oblique fortiter striati, superiores quatuor regulariter crescentes, ultimus et penultimus longe majores, ultimus elongatus, supra aperturam lævior et subcomplanatus, primo peroblique descendens, sed ad labrum breviter ascendens; spira obtusissima; sutura mediocriter profunda; apertura subovata, intus sordide albida, longit. totius* $\frac{1}{3}$ *paulo superans, denticulo unico parietali munita; peristoma album, incrassatum, anguste reflexum, marginibus callo crassiusculo junctis.*

Longit. 20 *millim., diam.* 10; *apertura* 8 *longa,* $5\frac{2}{3}$ *lata.*

Hab. Fort Johnston, Upper Shiré River (*A. Whyte*).

This interesting shell is quite unlike any other known species, but recalls the form of some of the Mauritian *Gonospiræ*, e. g. *G. modiolus*, Férussac, although the relative proportion of the whorls is quite different. The oblique striæ are distinct and thread-like, but less observable upon the body-whorl above the aperture, where the surface has a faintly flattened appearance. With this species I have associated the name of H. H. Johnston, Esq., the spirited Commissioner of this Country in British Central Africa, and the donor to the Museum of the specimens.

2. Ennea karongana. (Plate LIX. fig. 2.)

Testa cylindracea, rimata, alba, nitida; anfractus 7, *lente accrescentes, læves, leviter convexiusculi, sutura profunda vix obliqua sejuncti; spira cylindrica, ad apicem obtuse conica; anfr. ultimus antice haud descendens vel ascendens, pone labrum profunde*

indentatus; apertura irregularis, longit. totius $\frac{3}{10}$ subæquans, dentibus quinque albis (uno parietali lamelliformi valde prominente, uno columellari crasso æque prominente, tertio infra columellarem minimo, quarto et quinto intra labrum sitis, quinto bidentato) munita; peristoma album, leviter expansum et incrassatum.

Longit. $8\frac{2}{3}$ *millim., diam.* 4; *apertura* $2\frac{1}{2}$ *longa.*

Hab. Karonga, west shore of Lake Nyasa (*R. Crawshay*).

This species exhibits scarcely any trace of sculpture. The indentation on the body-whorl behind the lip indicates the position of the labral teeth. The upper one of these is planted somewhat obliquely and is distinctly bipartite. The parietal lamella is thin, hollowed out or concave on the right side or towards the labrum, which it practically touches at the upper extremity.

3. Helix (Pella) whytei. (Plate LIX. figs. 3, 4.)

Testa depresse globosa, anguste perforata, tenuis, flavo-virescens, superne vix nitida, infra polita; anfractus $5\frac{1}{2}$, *subceleriter crescentes, convexi, lineis incrementi oblique arcuatis sculpti; spira brevis, conica, ad apicem subobtusa; anfr. ultimus magnus, ad peripheriam rotundatus; apertura late lunaris, parum obliqua; sutura mediocriter profunda, anguste marginata; peristoma undique tenue, supra umbilicum breviter reflexum.*

Diam. maj. 20 *millim., min.* $16\frac{1}{2}$; *alt.* 13.

Hab. Fort Johnston, Upper Shiré River. (Collected by Mr. A. Whyte.)

Allied to *Pella arnotti*, Benson, but more globose and without the minute spiral striation on the upper surface.

All the specimens, about thirty, have been collected without the living animal, and in this condition most of them have the spire more or less bleached. In addition to the lines of growth, occasionally a few spiral lineations are observable, and a few small malleations or indentations make the upper surface more or less uneven.

4. Livinhacia nilotica, Pfeiffer.

Hab. Angoni-Land, south-west of Lake Nyasa (*A. Whyte*); Itawa, west of Lake Tanganyika (*R. Crawshay*).

This species has a wide range, extending from the White Nile district along the lake-region as far south as the southern end of Nyasa, a distance of from fifteen to eighteen hundred miles. It varies considerably in form.

5. Buliminus (Rachis) stictus, Martens.

Hab. Angoni-Land (*A. Whyte*). Tette, Mozambique (*Martens*). A single typical example.

6. Limicolaria martensiana, Smith.

Hab. Sumbu, Itawa, S.W. of Tanganyika (*R. Crawshay*).

7. Achatina sp. inc.

Hab. Angoni-Land (*A. Whyte*).

A number of specimens of two species of *Achatina* occur in the collection; they are all, however, in too bad a condition for identification. One is very like *A. tavaresiana*, Morelet, from Angola; the other is considerably larger and rather like the form of Reeve's figure of *A. fulica* (Conch. Icon. pl. 2. f. 8).

8. Ampullaria ovata, Olivier.

Hab. Sumbu, Itawa, S.W. side of Lake Tanganyika (*R. Crawshay*).

This Nilotic species has already been recorded from the lake (P. Z. S. 1880, p. 348).

9. Lanistes solidus, Smith.

Hab. Karonga, west shore of Lake Nyasa (*R. Crawshay*).

One dead specimen.

10. Lanistes affinis, Smith.

Hab. With the preceding (*Crawshay*); Angoni-Land (*Whyte*).

In dead condition from Karonga. The large number of specimens from Angoni-Land are all small or only half-grown.

11. Lanistes nyassanus, Dohrn.

Hab. Angoni-Land, south-west end of Lake Nyasa (*A. Whyte*).

The eight specimens of this fine species are all in a worn condition and were evidently picked up dead upon the shore.

12. Lanistes ovum (Peters MS., Troschel).

Hab. Kabwiri, Lake Mweru (*R. Crawshay*).

This species was originally described from Mozambique, and although quoted from Lake Nyasa I have not yet seen specimens from there myself.

13. Viviparus tanganyicensis (Smith).

Hab. Sumbu, Itawa, S.W. end of Lake Tanganyika (*R. Crawshay*).

Some of the specimens from this locality are remarkably tabulated, as in Bourguignat's figure (Ann. Sci. Nat. 1890, vol. x. pl. iii. fig. 1), and the body-whorl is even more strongly keeled at the periphery. The eight so-called species of *Neothauma* figured by Bourguignat must be regarded as varieties of this variable form.

The nomenclature of this genus has been fully discussed of late by Mr. Dall[1], but his conclusions, to my mind, are open to objection. In the first place, I would point out that *Martini* was not a binomial author, excepting in occasional or chance instances, and therefore that such chance names as he may have given cannot be accepted.

[1] Trans. Wagner Free Inst. Sci. Philad. 1892, vol. iii. pt. 2, pp. 332–335.

Mr. Dall observes, "If it were not for Martini's name it is very likely that the name *Bulimus*, Scopoli, would have to be adopted for this genus." This appears to me an entirely wrong conclusion, for Scopoli at the reference cited (Introd. Hist. Nat. p. 392) neither described nor referred to any species of the genus in question, and the figure in Swammerdam's work (Bib. Nat. tab. ix. fig. 4) does not represent *Vivipara fasciata* as stated by Dall (he cannot have seen the work), but is a fairly characteristic representation of a *Limnæa*, apparently *L. stagnalis*.

I do not for a moment believe that Scopoli intended that *Bulimus* was to be regarded either as distinct from or an emendation of Adanson's *Bulinus*. I regard it as merely an oversight in the spelling, or a printer's error. If he considered it distinct, surely he would not have put Adanson's name after it; moreover he clearly tells us (Delic. Flor. et Faun. Insub. 1786, p. 67) that, following Adanson, he calls certain shells "*Bulimos*." I think the preceding remarks fairly answer Mr. Dall's question as to "how we can avoid retaining Scopoli's name *Bulimus* for the species *Helix tentaculata*, Linné," now classified under Gray's genus *Bythinia*, for, if we take the figure of Swammerdam as his type, *Bulimus* would then replace *Limnæa*, and if we select the first species he quotes (*Helix putris*) it would take the place of *Succinea*.

The objection raised by Mr. Dall against using *Viviparus* on the grounds that there is an impropriety in making the "bearer of living young" a male, is of little importance. Perhaps it would have been fortunate had Montfort used the feminine termination; but as he did not, I, for one, prefer to let the genus remain *Viviparus* as originally published.

14. Viviparus mweruensis. (Plate LIX. figs. 5, 6.)

Testa umbilicata, conica, in medio carinata, tenuis, subpellucida, pallida, epidermide fugaci tenui olivacea induta; anfractus 6, *subceleriter accrescentes, oblique tabulati, superne obtuse angulati, striis spiralibus plus minus punctatis tenuissimis confertis, lineis incrementi obliquis decussatis sculpti, ultimus ad peripheriam conspicue et subacute carinatus, inferne concentrice punctato-striatus; spira conica, turrita, ad apicem acuta; apertura angulatim rotundata, longit. totius* ½ *haud æquans, antice subacuminata, paulo effusa; peristoma tenue, margine dextro obliquo, ad carinam angulato, late sinuato, columellari arcuato, anguste expanso et reflexo.*

Longit. 37 *millim., diam.* 30; *apertura* 17 *longa*, 16 *lata.*

Var. pagodiformis. (Plate LIX. fig. 7.) *Testa sub epidermide tenui plus minus rosacea, anfractibus planiusculis, inferne ad suturam forte carinatis, pagodiformibus, et apertura in medio labri acute angulata.*

Hab. Lake Mweru (*R. Crawshay*).

This is one of the most interesting shells in the collection, and belongs to that group of the genus *Viviparus* which I at one time considered distinct, and described under the name *Neothauma*,

A subsequent examination of the animal has apparently proved that there is not sufficient reason for separating it. The present species is remarkable for its conical spire, the conspicuous keel around the middle of the body-whorl, and its somewhat wide umbilicus. In shells belonging to the variety, the whorls are almost flat and without the shouldering at the upper part observable in typical examples, and the peripheral keel winds up the spire above the suture, producing a decided pagoda-like appearance. The operculum is thin, concentrically striated as usual, and also exhibits (especially upon the inner glossy surface) some more or less distinct radiating striæ.

15. Viviparus crawshayi. (Plate LIX. fig. 8.)

Testa ovata, conica, rimata, carinata, cornea, epidermide tenui, olivacea, spiraliter et oblique striata, induta, versus apicem rubro purpurea; anfractus 6, *convexiusculi, ultimus ad peripheriam forte carinatus; apertura angulatim rotundata, longit. totius* ½ *haud æquans; peristoma tenue, margine columellari arcuato, anguste reflexo, albo-cæruleo. Operculum normale.*

Longit. 18½ *millim., diam.* 13; *apertura* 9 *longa.*

Hab. Lake Mweru (*R. Crawshay*).

This species resembles *V. unicolor*, Olivier, *V. robertsoni*, Frauenfeld, and a few others, but may be distinguished by its much more pronounced keel and conspicuous spiral striæ.

16. Viviparus capillaceus, Frauenfeld.

Hab. Angoni-Land, south end of Lake Nyasa (*A. Whyte*).

17. Cleopatra johnstoni. (Plate LIX. fig. 9.)

Testa ovato-conica, vix rimata, epidermide olivacea induta, carinata; spira conica, ad apicem erosa; anfractus 7, *plani, inferne ad suturam carinati, lineis incrementi curvatis tenuibus sculpti, ultimus in medio carinatus, infra carinam convexiusculus, interdum carina secunda minus conspicua prope medium cinctus; apertura ovata, superne et infra leviter acuminata, longit. totius* ½ *fere æquans, sordide vel cæruleo-albida; peristoma continuum, margine externo tenui, superne haud profunde sinuato, columellari arcuato leviter incrassato et reflexo. Operculum primo paucispirale, exinde concentricum.*

Longit. 17 *millim., diam.* 10; *apertura* 8 *longa,* 6 *lata.*

Hab. Lake Mweru (*R. Crawshay*).

This is a very interesting species and recalls the general aspect of some of the North-American *Pleuroceridæ*. Two of the three specimens at hand have the second feebler keel upon the body-whorl, and it is situated just below the peripheral carination. The operculum agrees precisely with that of *C. bulimoides* from the Nile. Named in honour of H. H. Johnston, Esq., C.B.

18. Cleopatra mweruensis. (Plate LIX. fig. 10.)

Testa ovato-acuminata, anguste perforata, subtenuis, sordide

flavida, epidermide tenui induta, liris paucis nigris vel saturate rufis ornata; anfractus circiter 7, convexiusculi, superiores liris spiralibus tribus cincti et zona nigra infra suturam picti, ultimus liris quinque æqualibus duobusque basalibus circa rimam instructus, inter liris lineis incrementi conspicuis fortiter sculptus, zona suturali nigra alteraque circa basim ornatus; apertura ovalis, superne et infra paulo acuminata, longit. totius $\frac{1}{2}$ vix æquans; peristoma tenue, marginibus callo tenui junctis, columellari subreflexo.

Longit. 15 *millim., diam.* 8; *apertura* $6\frac{1}{3}$ *longa,* 4 *lata.*

Hab. Lake Mweru (*R. Crawshay*).

This species is of the same character as *Cleopatra emini*, Smith (P. Z. S. 1888, p. 54), from the Albert Nyanza. It is somewhat larger, has less angular whorls, more keels or liræ, and a narrower basal rimation. The longitudinal sculpture or lines of growth are considerably more conspicuous.

19. Melania tuberculata, Müller.

Hab. Angoni-Land (*A. Whyte*).

This species occurs in Tanganyika, Oukéréwé, the Albert Nyanza, and has previously been recorded from Nyasa.

20. Melania nodicincta, Dohrn.

Hab. Angoni-Land (*A. Whyte*).

The single specimen which I assign to this species is, in some respects, intermediate between it and *M. tuberculata*.

21. Melania turritospira, Smith.

Hab. Angoni-Land (*A. Whyte*).

The specimen from this locality is twice as long as those figured in these 'Proceedings' for 1877, pl. lxxv. figs. 14, 15. Those figures represent the surface too nodose. This species belongs to the so-called genus *Micronyassia* of Bourguignat.

22. Melania woodwardi. (Plate LIX. fig. 11.)

Testa brevis, turrita, nigro-fusca, infra suturam pallidior; anfractus circiter 8, *vix convexiusculi, costis obliquis crassis* 11–12 *sulcisque transversis angustis paucis* (*in anfr. superioribus* 2–3, *in ultimo circiter* 10) *ornati, ultimus costis versus medium sensim obsoletis; apertura ovata, superne acuminata, longit. totius $\frac{1}{3}$ paulo superans; columella arcuata, alba, incrassata, reflexa.*

Longit. 19 *millim., diam.* 8; *apertura* $6\frac{1}{2}$ *longa.*

Hab. Lake Nyasa.

The single specimen here described was presented to the Museum by Mr. B. B. Woodward, after whom the species has been named. It is quite distinct from any of the other Nyasa forms. It is a short stumpy shell, of a very dark colour, with oblique coarsely nodose ribs, the nodules being produced by the spiral sulci cutting through the costæ.

23. Melania mweruensis. (Plate LIX. fig. 12.)

Testa elongata, acuminata, albida, punctis rufis, in seriebus transversis dispositis, ornata, epidermide tenuissima pallide olivacea induta; spira elongata, acuminata; anfractus circiter 10, *fere plani, inferne ad suturam leviter constricti vel canaliculati, plicis obliquis sulcis spiralibus decussatis instructi, infra suturam crasse marginati vel balteati, ultimus plicis prope medium obsoletis, inferne transversim sulcatus; sutura parum obliqua; apertura acuminato-ovalis, superne angustata, longit. totius* $\frac{1}{3}$ *paulo superans; labrum tenue, superne late et subprofunde sinuatum; columella curvata, alba, incrassata.*

Longit. 22 *millim., diam.* 8; *apertura* 7 *longa,* $4\frac{1}{3}$ *lata.*

Hab. Lake Mweru (*R. Crawshay*).

This species, although spotted like *M. tuberculata*, is sufficiently distinct from that form. The plicæ are coarser, the whorls flatter, and the lip more sinuated. The spiral sulci are four in number on the upper whorls and about eight on the body-whorl; they cut through the oblique folds, giving them a more or less nodose appearance. The red dots, which are sometimes produced into short transverse lines, fall upon the ridges between the sulci, and never in the grooves themselves. In some specimens the oblique costæ are almost obsolete, especially upon the last and penultimate whorl.

24. Melania imitatrix. (Plate LIX. fig. 13.)

Testa elongata, acuminata, epidermide luteo-olivacea amicta, punctis rufis paucis sparsis picta; anfractus 8–9, *fere planiusculi, costis oblique arcuatis* 16–18, *quadriseriatim granosis, instructi, ultimus infra medium transversim sulcatus; apertura ovata, superne acuminata, longit. totius* $\frac{1}{3}$ *adæquans; labrum supra late sinuatum, antice prominens; columella inferne arcuata, incrassata, alba, reflexa.*

Longit. 21 *millim., diam.* 8; *apertura* 7 *longa.*

Hab. Lake Mweru (*R. Crawshay*).

This species is like *M. tuberculata*, but has less coarse whorls, more distinct ribbing and granulation.

25. Melania crawshayi. (Plate LIX. fig. 14.)

Testa angusta, elongata, albida, epidermide pallide olivacea induta; anfractus 9, *infra suturam serie conspicua, obliqua, conferta tuberculorum cincti, infra nodulos constricti, deinde convexiusculi, lirisque tribus, quarum suprema nodosa, spiraliter instructi, ultimus liris circiter* 9 *cinctus; apertura anguste ovata; labrum tenue; columella arcuata, alba, incrassata.*

Longit. 17 *millim., diam.* $5\frac{1}{2}$: *apertura* $5\frac{1}{2}$ *longa,* $3\frac{1}{4}$ *lata.*

Hab. Lake Mweru (*R. Crawshay*).

The row of tubercles bordering the suture is prominent and very remarkable. Beneath comes a broad constriction, below which are three transverse ridges, of which the uppermost is ornamented

with nodules, but much smaller than the sutural series. It is a remarkable-looking shell, and probably peculiar to the lake.

26. Physa nyasana, Smith.

Hab. Karonga, west shore but towards the northern end of Lake Nyasa (*R. Crawshay*).

The original specimens (described P. Z. S. 1877, p. 717, pl. lxxv. figs. 16, 17) were obtained at the southern part of the lake.

27. Physa karongensis. (Plate LIX. fig. 15.)

Testa ovata, angusta, perforata, pallide fuscescens; anfractus $3\frac{1}{2}$, *celeriter crescentes, convexi, infra suturam plus minus distincte marginati, lineis incrementi sculpti, ultimus oblique descendens; spira brevis, obtusa; apertura angusta, elongata, longit. totius* $\frac{2}{3}$ *paulo superans; columella contorta, reflexa; labrum tenue, intus leviter incrassatum.*

Longit. $7\frac{3}{4}$ *millim., diam.* $5\frac{1}{2}$; *apertura* $5\frac{1}{2}$ *longa,* $2\frac{2}{3}$ *lata.*

Hab. Karonga.

This species is narrower than *P. nyasana*, has the spire more elevated, the last whorl obliquely descending and the aperture consequently shorter. This is the third species now known from Nyasa.

28. Planorbis (Planorbula) alexandrina, var.

Hab. Karonga, Lake Nyasa.

This is the first record of the genus from the lake. The single specimen is a link between those from Tanganyika (figured by me P. Z. S. 1881, pl. xxxiv. figs. 30–30 *b*) and the typical form from Egypt. M. Bourguignat (Ann. Sci. Nat. Zool. vol. x. 1890, p. 23) has considered this variety a distinct species under the name of *Planorbula tanganikana*.

29. Unio nyassaensis, Lea. (Plate LIX. figs. 16, 17.)

Hab. Angoni-Land, south end of lake Nyasa (*A. Whyte*).

This species is very variable in form and sculpture and offers a fine field for the manufacture of so-called species. Lea described three forms of it under as many names, and M. Bourguignat [1] has given a name to a variety which was figured by me in the Society's Proceedings, 1881, pl. xxxiv. fig. 34.

30. Unio (Metaptera) johnstoni. (Plate LIX. figs. 18–20.)

Testa compressa, transversa, elongata, antice nasuta, postice acuminata, ad marginem dorsalem sursum acute alata, tenuis, pallida, epidermide dilute virescente postice obscure radiata induta, versus umbones margaritacea, inæquivalvis, valde inæquilateralis, utrinque angustissime hians; valvæ striis incrementi tenuibus sculptæ, supra umbones tenuiter corrugatæ; margo dorsi incurvatus, ventralis late excurvatus, posticus inter alam dorsalem et extremitatem posteriorem valde sinuatus; pagina

[1] Bull. Soc. malacol. France, 1889, vol. vi. p. 38.

interna pulcherrime margaritacea, iridescens, interdum pallide rosacea; dens cardinalis anticus valvæ sinistræ elongatus, leviter corrugatus, v. dextræ duplex, dens posticus unicus v. dextræ elongatus, rectus, tenuis, prominens, v. sinistræ duplex.

Longit. 53 *millim.*, *alt.* 30, *diam.* 9½.

Hab. Lake Mweru (*R. Crawshay*).

The shells here described are probably only small representatives of this species. The species is quite unlike any other known form from Africa. It recalls the *Unio delphinus*, Gruner, from Malacca, on account of the dorsal wing, and agrees with it also exactly in the hinge-dentition and the ligament. In form it even more closely resembles *Hyria elongata*, Swainson, from British Guiana (Exotic Conch. p. 29, pl. xxiv.).

31. Pliodon spekei (Woodward).

Hab. Sumbu, S.E. Tanganyika (*R. Crawshay*).

Only one species of this genus from Lake Tanganyika has come under the writer's observation, although as many as twenty-six *so-called species* are enumerated by Bourguignat[1].

Like many of the "*species*" from the Central African lakes described by that author, they are of little or no value.

32. Mutela (Spatha) nyassaensis, Lea.

Hab. Nyasa (*A. Whyte*).

The specimens in the present collection are considerably larger than Lea's type, being 3¾ inches long, 2¼ high, and 1¼ in diameter. Besides being more oval than *S. rubens*, as pointed out by Lea, this species is more inæquilateral, the beaks being situated much more anteriorly and less prominent. The impression of the visceral-sac attachment near the anterior adductor scar is smaller also.

EXPLANATION OF PLATE LIX.

Fig. 1. *Ennea johnstoni*, p. 633.
2. —— *karongana*, p. 633.
3, 4. *Helix* (*Pella*) *whytei*, p. 634.
5, 6. *Viviparus mweruensis*, p. 636.
7. —— ——, var. *pagodiformis*, p. 636.
8. —— *crawshayi*, p. 637.
9. *Cleopatra johnstoni*, p. 637.
10. —— *mweruensis*, p. 637.
11. *Melania woodwardi*, p. 638.
12. —— *mweruensis*, p. 639.
13. —— *imitatrix*, p. 639.
14. —— *crawshayi*, p. 639.
15. *Physa karongensis*, p. 640.
16, 17. *Unio nyassaensis*, p. 640.
18, 19, 20. —— *johnstoni*, p. 640.

[1] Nouveautés Malacol., I. Unionidæ et Iridinidæ du lac Tanganika, 1886, pp. 66–93; Iconogr. Malacol. Tanganika, 1888, pls. xxxi.–xxxv.

4. Descriptions of two new Species of Shells of the Genus *Ennea*. By Edgar A. Smith.

[Received August 28, 1893.]

Ennea (Ptychotrema) bassamensis. (Woodcut, fig. 1.)

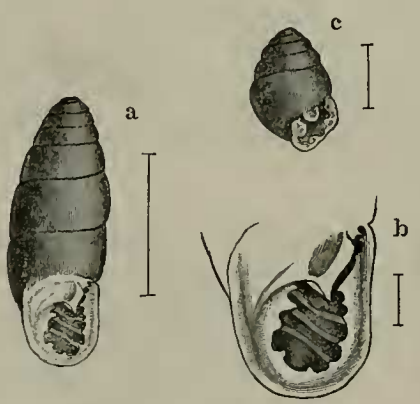
Testa elongata, pupiformis, albida; anfractus 8–9, *convexiusculi, sutura profunda paulo obliqua sejuncti, costulis confertis filiformibus obliquis instructi, ultimus postice ad basin bi-scrobiculatus, prope labrum breviter ascendens; apertura alba, rotunde quadrata, longit. totius* $\frac{1}{3}$ *adæquans, plicis et denticulis inæqualibus ringens, plica parietali valida lamelliformi intrante, denticulis tribus columellaribus, unico basali minimo, liris inæqualibus quatuor, lamella unica et denticulo intra labrum munita; peristoma leviter incrassatum, reflexum, album, nitens, marginibus callo tenui junctis.*

Longit. 15 *millim., diam.* 5; *apertura* $4\frac{2}{3}$ *longa,* $3\frac{1}{2}$ *lata.*

Hab. Abidjean, Grand Bassam, West Africa.

The first four whorls are rather more convex than the rest, almost smooth, and destitute of the fine oblique liræ which orna-

Fig. 1.



Ennea (*Ptychotrema*) *bassamensis.*

ment the rest of the shell. The upper edge of these whorls has a narrow pellucid margination and appears crenulated. The dentition of the aperture is best explained by means of a figure (fig. 1 *b*).

Ennea cyathostoma, Pfr., from Old Calabar, is closely allied to this species, but differs in its superior size and the dentition of the aperture.

Fig. 1 *c* represents the young state of this species, in which the armature of the aperture is quite different from that of the adult form.

F.W.Frohawk del.et lith.

West, Newman chromo.

New Butterflies from British Central Africa

ENNEA (EDENTULINA) LONGULA. (Woodcut, fig. 2.)

Testa elongata, pupiformis, rimata, albo-cornea; anfractus 8, *convexiusculi, sutura leviter obliqua et profunda discreti, tenuiter, confertim et oblique lirati, ultimus supra aperturam lævior, haud liratus, antice ad labrum breviter ascendens; apertura inverse subauriformis, longit. totius* $\frac{1}{3}$ *æquans; peristoma leviter incrassatum, anguste reflexum, margine columellari dilatato, reflexo, intus oblique subtorto, dextro arcuato.*

Longit. 16 *millim., diam.* 6; *apertura* 5 *longa,* $3\frac{2}{3}$ *lata.*

Hab. Mayotte (*ex coll. Emile Eudel*).

This species is more elongate than most of the forms of *Edentulina* and bears a general resemblance to *Elma swinhoei* of H. Adams.

Fig. 2.

Ennea (*Edentula*) *longula.*

The outer lip, however, is not deeply sinuated as in that section of the genus *Ennea*.

The types of this and the preceding species have been presented to the British Museum by Mr. H. Fulton.

5. On two Collections of Lepidoptera sent by H. H. Johnston, Esq., C.B., from British Central Africa. By ARTHUR G. BUTLER, Ph.D., F.L.S., F.Z.S., &c.

[Received September 20, 1893.]

(Plate LX.)

The collections, of which the following is an account, were made by Mr. R. Crawshay and Mr. A. Whyte respectively; the first principally at Lake Mweru in 1891 and 1892, the second at Zomba between July 1892 and January 1893. Of the two series the former is in by far the better condition, and the latter considerably more numerous both in species and individuals. So many of the species in the two series are identical that I have thought it better to combine them in one paper: together they represent no less than 216 species, the majority of which belong to the South African fauna. Thirty-one species are described as new to science.

Rhopalocera.

1. Amauris ochlea.

Danais ochlea, Boisduval, Voy. de Deleg. ii. p. 589 (1847).

Zomba, Jan. 1893.

2. Amauris lobengula.

Nebroda lobengula, E. M. Sharpe, Ann. & Mag. Nat. Hist. ser. 6, vol. vi. p. 346 (1890).

♂. Near to *A. albimaculata* of Natal, considerably larger and with the costal margin of the primaries comparatively longer (even more so than in *A. hanningtonii*); the spot in the cell much larger, the latter and the subquadrate spot at centre of the lower median interspace of a less pure white; the ochreous belt on the secondaries brighter and of fully double the width; submarginal spots nearly as in *A. echeria*. Expanse of wings 90 millim.

Zomba, July 1892.

Our largest male example of *A. albimaculata* measures 72 millim. in expanse.

3. Amauris whytei, sp. n.

♂ ♀. Near to *A. echeria*; larger, the primaries with white spots very slightly tinted with ochre and formed as in *A. hanningtonii*; the secondaries with the ochreous belt paler and duller, resembling the under-surface colouring in *A. echeria*, quite half as wide again as in that species, and with a less acutely angled outer edge: from the preceding species it differs in its inferior size, less produced primaries with yellower spots, the narrower, duller, and paler ochreous belt on the secondaries, and consequently broader black outer border. Expanse of wings 85 millim.

Zomba, December 1892.

I had hoped to find that this was the *A. steckeri* of Kheil, the label of which remained a blank in the collection; but, on looking up the description and figure, I find that *A. steckeri* is typical *A. echeria* and has been compared with *A. albimaculata* under the impression that the latter represented Stoll's species. *A. whytei* is nearer to *A. jacksoni*, E. M. Sharpe, but perfectly distinct.

4. Limnas chrysippus.

Papilio chrysippus, Linnæus, Mus. Lud. Ulr. p. 263 (1764).

♂ ♀, Zomba, July 1892; ♀, Lake Mweru.

4 *a*. Limnas klugii.

Limnas klugii, Butler, P. Z. S. 1885, p. 758, n. 2.

♀, Rhodesia, Lake Mweru, June 11, 1892.

4 *b*. Limnas dorippus.

Euplœa dorippus, Klug, Symb. Phys. pl. 48. figs. 1–4.

♀, Lake Mweru.

I did not find *L. alcippus* in the collection; but as *Hypolimnas*

alcippoides was in the Zomba series, it is only reasonable to suppose that *L. alcippus* also occurs there.

5. Melanitis solandra.

Papilio solandra, Fabricius, Syst. Ent. p. 500, n. 244 (1775).

Zomba, December 1892 and January 1893.

This is one of the forms of *M. leda* which is not found in India. As already stated, I think the Indian type is, to all intents and purposes, a species distinct from the rufescent form named by Linnæus: when two variable and allied species exhibit similarity *without identity* in one of their many sports, they must still be considered distinct.

6. Melanitis libya.

Melanitis libya, Distant, Ann. & Mag. Nat. Hist. ser. 5, vol. x. p. 405 (1882).

♀, Zomba, January 1893.

The colouring of the under surface evidently differs from that of the type; but, in a genus in which both the colouring and pattern of that surface vary indefinitely, this is unimportant.

7. Gnophodes diversa.

Gnophodes diversa, Butler, Ann. & Mag. Nat. Hist. ser. 5, vol. v. p. 333 (1880).

Zomba, July 1892.

8. Mycalesis (Monotrichtis) rhacotis.

Mycalesis rhacotis, Hewitson, Ex. Butt. iii., *Myc.* pl. 8. fig. 50 (1866).

Lake Mweru; Zomba, July 1892, January 1893.

9. Mycalesis (Monotrichtis) eusirus.

Mycalesis eusirus, Hopffer, Ber. Verh. Ak. Berl. 1855, p. 641, n. 13.

Lake Mweru; Zomba, July 1892, January 1893.

I think it doubtful whether this is more than a form of the preceding species, which, however, it would of course supersede if not distinct.

10. Mycalesis (Monotrichtis) miriam.

Papilio miriam, Fabricius, Ent. Syst. iii. 1, p. 242, n. 754 (1793).

Zomba, July and December 1892.

This species varies considerably in size and the greater or less regularity of the outer line of the central belt; examples from the West Coast of Africa in the Museum Collection show a more dentate-sinuate character in this line, especially on the primaries, than those in the present series; but in all other details they correspond.

11. Samanta perspicua.

Mycalesis perspicua, Trimen, Trans. Ent. Soc. London, 1873, p. 104, pl. 1. fig. 3.

Zomba, July 1892 and January 1893.

This species varies in depth of colour and in the width of the pale outer border to the central belt on the under surface; some examples incline to grey and others to ochreous on this surface.

Neocœnyra, Butl.

Mr. Trimen (P. Z. S. 1891, p. 62) sinks this genus as a synonym of *Pseudonympha*, Wllgr., stating that all the characters which I have given to distinguish it from *Cœnyra* are such as occur in *Pseudonympha*; he fails to notice that the palpi and antennæ correspond (as stated in my diagnosis) with those of *Cœnyra*. In *Pseudonympha*, on the other hand, the palpi are clothed with much longer hairs, and the antennæ have a flattened spatulate club. As regards the type (*N. duplex*), which Mr. Trimen sinks as a probable synonym of *Ypthima bera*, Hewits., it is not only not nearly allied to the latter, but it has a totally different appearance, all the red markings being entirely unrepresented in Hewitson's species. I quite agree with my friend in disliking imperfectly characterized genera; but when, after careful comparison with all allied genera, I find it necessary to found a new one, it somewhat surprises me to be informed that it is synonymous with one of the very genera mentioned in the original description as differing in structure.

12. Neocœnyra ypthimoides, sp. n.

Allied to *N. bera*, slightly larger and much darker, the deeper coloration being especially noticeable on the under surface: primaries above with the paler patch enclosing the ocellus extended to inner margin and confined throughout its length by a sinuated dusky postmedian line and a blackish feebly undulated submarginal line; a second small ocellus frequently present on the lower median interspace: in the secondaries the submarginal line is almost regular, not zigzag towards apex as in *N. bera*; the ocelli vary in number from five to six, that nearest the costa being either large, small, or absent, that on the lower radial interspace either small or absent, the two on the median interspaces largest, as in *N. bera*, and the two nearest anal angle small and confluent; the pale area enclosing the ocelli is bounded internally by a widely zigzag dusky postmedian line: markings below as above, but sometimes more sharply defined. Expanse of wings 40–48 millim.

Zomba, July and December 1892, January 1893.

This appears to be a common species, of which the collection contained a long series: I have compared eleven of them with Hewitson's four examples of *N. bera* and find the differences absolutely constant.

13. Ypthima itonia.

Ypthima itonia, Hewitson, Trans. Ent. Soc. ser. 3, vol. ii. p. 287, n. 11, pl. 18. fig. 13 (1865).

Zomba, December 1892 and January 1893.

The white areas below vary a little in intensity and the ocelli in size; but in other respects this species seems to be wonderfully constant.

14. Ypthima simplicia.

Ypthima simplicia, Butler, Ann. & Mag. Nat. Hist. ser. 4, vol. xviii. p. 481 (1876).

Lake Mweru; Zomba, July and December 1892, January 1893.

15. Periplysia johnstoni, sp. n. (Plate LX. fig. 1.)

Wings above cream-coloured; the transverse striations of the under surface showing more or less distinctly through the wings: primaries with the swollen part of the subcostal vein ochreous; costal border to subcostal vein, an apical patch continuous with it and extending downwards to first median branch, outer border in the male, and a broad internal border regularly excised near the external angle, blackish; four or five more or less distinct blind black ocelli with orange irides in a straight line across the disk to second or first median branch, three regular parallel submarginal and marginal black stripes: secondaries with the costa and external border in the male broadly blackish, the latter partly enclosing a submarginal series of black spots; the three black stripes or lines as in the primaries, but more or less distinctly interlined with white (as in all the wings of the female); female with the costal area more or less smoky grey; a blackish diffused submarginal band, sometimes with excised external sinuations, enclosing a series of more or less distinct ocelli with dull orange irides. Body above black, below cream-coloured, with black striæ and three lines on outer border as above; a series of orange ocelli with metallic leaden pupils, five on the primaries and seven on the secondaries (the last two confluent); the central area in the male widely devoid of striation, but in the female the clear space is only represented by an ill-defined fusiform transverse patch or band bounding the ocelli internally. Expanse of wings 37–40 millim.

Zomba, January, July, and December 1892.

This pretty little species is evidently not uncommon; it is a link between *P. leda* and *P. panda*, the under surface of the female being very similar to that of the latter species, only with more sharply defined black striations.

16. Charaxes saturnus.

♂. *Charaxes saturnus*, Butler, P. Z. S. 1865, p. 624, n. 5, pl. 36. fig. 1; ♀. Lep. Exot. i. p. 5, pl. 2. fig. 2 (1869).

Sulim bin Najimb, Konde, Jan. 22, 1893 (*R. Crawshay*).

17. Charaxes jocaste.

♂. *Charaxes jocaste*, Butler, P. Z. S. 1865, p. 628, n. 21.

♀. *Charaxes achæmenes*, Felder, Reise der Nov., Lep. iii. p. 446, n. 729, pl. 59. figs. 6, 7 (1867).

Zomba, July 1892.

I do not see why the name *C. jocaste* should be ignored, since thousands of descriptions applicable to half a dozen species coming from the same locality are allowed to stand. My description characterized four species, of two of which the locality was established, one being from India and the other from Senegal; both species were well known under the names *C. fabius*, Fabr., and *C. jocaste*, Boisd., MS. In the absence of any other known African species, *C. jocaste* from Senegal was perfectly recognizable by my description; therefore it seems to me that, as a matter of fact, it was sufficiently characterized and the name *C. jocaste* (as a matter of principle) should supersede that of *C. achæmenes*. The object of a description is not to glorify the author of it, but to render a new species recognizable, and it is on this account that good figures of new species (when named), although unaccompanied by any description whatever, are recognized as claiming priority over subsequent descriptions of the same species. It is immaterial by what name a species is known, provided that the oldest name by which it was recognized is retained.

18. Charaxes guderiana.

♂. *Nymphalis guderiana*, Dewitz, Nova Acta Akad. Naturf. Halle, 1879, p. 200, pl. 2. fig. 18.

♂, December 1892; ♂ ♀, January 1893; ♂, Mipa Stream, Mofwi, August 3, 1892 (*R. C.*).

The female approaches that sex of *C. kirkii*, being crossed above by a buff band which on the primaries is broken up, above the first median branch, into two series of spots divergent on the costal area; the bluish-white discoidal spot of the male is also represented by a buff spot.

19. Charaxes alladinis.

♀. *Charaxes alladinis*, Butler, Cist. Ent. i. p. 5, n. 3 (1869); Lep. Exot. i. pl. 10. fig. 2 (1870).

♂. Above very near to *C. hollandii* (the Sierra Leone representative of *C. ethalion*), but in outline of wing even more quadrate than *C. ethalion* itself, the primaries having a much less arched outer margin and the secondaries being shorter. Above blue-black: primaries with the costa, basal fourth, apex, and outer margin bronze green; two subapical obliquely placed unequal greenish-white spots: secondaries with the costal area purplish brown, the abdominal area, including the greater part of the discoidal cell, clothed with brown hair; external area and veins greenish; a shining bronze-green lunulated stripe halfway between the cell and outer margin, only the last four sinuations

or lunules being well defined; a submarginal series of small blue spots edged internally with white; an irregular marginal border, the first three divisions of which are brick-red and the remainder golden-bronze, shading into white on centre of tails; extreme margin steel-black with scarcely perceptible white fringe. Below the usual markings prevail, but the ground-colour has the rufous character of that of the female. Expanse of wings 73 millim.

Ngama's, Kakoma, Aug. 5, 1892 (*R. C.*); Zomba, Jan. 1893.

20. Charaxes whytei, sp. n. (Plate LX. fig. 2.)

♂. Belongs to the *C. ethalion* group, but is very distinct, more nearly approaching *C. talaguga*, Holland, in pattern than any other species. Above blue-black, with a submarginal slightly sinuous series of seven greenish-grey spots, tapering from inner margin to last subcostal branch near the outer margin: secondaries with costa greyish; an opaline bluish-white belt changing in certain lights to grey or pale green, narrow at costa, gradually widening to third median branch, nearly of uniform width to just below first median branch, and then abruptly narrowed to inner margin; this belt leaves a rather narrow black outer border, enclosing a submarginal series of small white dashes, touched with blue near anal angle, and a marginal grey-greenish irregular stripe, streaked with dull golden buff and brick-red; extreme margin black. Body as usual; under surface having the usual character, somewhat reddish and sericeous, with a straight white transverse central band bounding the outer series of black lines forming the limit of the almost central belt, and which in this species are united into one almost unbroken line; the ordinary discal lunules united into an irregular, internally black-edged band of greenish, shading into clay-reddish. Expanse of wings 61 millim.

Zomba, December 1892 and January 1893.

21. Charaxes bohemani.

Charaxes bohemani, Felder, Wien. ent. Monatschr. 1859, p. 321, pl. 6. fig. 3.

Ngama's, August 5, 1892 (*R. C.*).

22. Charaxes pithodoris.

Charaxes pithodoris, Hewitson, Exot. Butt. v., *Charaxes*, pl. iv. figs. 18, 19 (1876).

Rhodesia, Lake Mweru, June 12, 1892.

23. Charaxes cithæron.

Charaxes cithæron, Felder, Wien. ent. Monatschr. iii. p. 308, pl. 8. figs. 2,3 (1859).

♀, Zomba, January 1893.

24. Charaxes tiridates.

Papilio tiridates, Fabricius, Sp. Ins. ii. p. 11, n. 43.

♂, Lake Mweru.

25. Charaxes neanthes.

Nymphalis neanthes, Hewitson, Exot. Butt., *Nymphalis*, pl. 1. figs. 2, 3 (1854).

♂, Lake Mweru.

26. Palla varanes.

Papilio varanes, Cramer, Pap. Exot. ii. pl. clx. D, E (1879).

Lake Mweru; Zomba, January 1893.

27. Hypolimnas misippus.

Papilio misippus, Linnæus, Mus. Lud. Ulr. p. 264 (1764).

♂, Zomba, January 1893; ♀, July 1892.

27 *a*. Hypolimnas alcippoides.

Hypolimnas alcippoides, Butler, Ann. & Mag. Nat. Hist. ser. 5, vol. xii. p. 102, n. 2 (1883).

♂ ♀, Zomba, July 1892; ♂, Lake Mweru.

27 *b*. Hypolimnas inaria.

Papilio inaria, Cramer, Pap. Exot. i. pl. ccxiv. A, B (1782).

♀, Lake Mweru.

The form *H. alcippoides* is generally smaller, and *H. inaria* larger, than the type form.

28. Panopea expansa.

Panopea expansa, Butler, Ann. & Mag. Nat. Hist. ser. 5, vol. ii. p. 177 (1878).

Lake Mweru.

The type of this species was received from Masasi.

29. Junonia artaxia.

Junonia artaxia, Hewitson, Exot. Butt. iii., *Jun.* pl. 1. fig. 6 (1864).

Zomba, July and December 1892, January 1893; Lake Mweru.

30. Junonia nachtigalii.

Precis nachtigalii, Dewitz, Nova Acta Akad. Naturf. Halle, 1879, p. 194, pl. 1. fig. 16.

Zomba, July 1892.

I can see no sufficient reason for distinguishing *Precis* from *Junonia*; the length of the palpi is a slightly variable character and, taken collectively, the difference in length between those of *Precis* as compared with *Junonia* appears to me extremely doubtful: as to the different form of wing, if strictly adhered to, that character would necessitate still further subdivision of the genus.

31. Junonia natalica.

Precis natalica, Felder, Wien. ent. Monatschr iv. p. 106, n. 65 (1860).

Zomba, July 1892, January 1893.

32. Junonia chapunga.

Junonia chapunga, Hewitson, Exot. Butt. iii., *Jun.* pl. 1. figs. 2, 3 (1864).

Zomba, January 1893.

Varieties also occur (taken in July 1892 and January 1893) which are intermediate in character between *J. chapunga* and *J. pelasgis*, the ocellated spots being united into an ochreous band and continuous with the short oblique band beyond the cell of primaries, which is also ochreous; Hewitson has an example of this variety in his series of *J. chapunga*.

33. Junonia ceryne.

Salamis ceryne, Boisduval, Voy. de Deleg. ii. p. 592 (1847).

♂, Lake Mweru; ♂ ♀, Zomba, January 1893.

34. Junonia galami.

Vanessa galami, Boisduval, Faun. Madag. p. 46 (1833).

Zomba, December 1892 and January 1893.

35. Junonia aurorina, sp. n. (Plate LX. fig. 3.)

Allied to *J. sinuata*, Plötz (=*serena*, Weymar), and very similar to both in pattern and in coloration, but the primaries almost of the same form as *J. galami*; the subapical angle is, however, a little more prominent, the outer margin less inarched, and the posterior angle less prominent: the secondaries are of the same form as in *J. sinuata*; below the central area is yellower and the outer borders washed with lilac. Expanse of wings, ♂ 57 millim., ♀ 60 millim.

Zomba, December 1892 and January 1893.

36. Junonia trimenii, sp. n. (Plate LX. fig. 4.)

Near to *J. micromera*, which it much resembles on the upper surface; it is, however, larger, and has a pinky-whitish diffused band in front of the series of black spots in the male; the central and double black band has two very acute angles, the black spots of the discal series are smaller, and the brown area at base of secondaries is restricted and followed by one or two black spots at the end of the cell; on the under surface all the dark markings on basal area are represented by irregular black spots quite clearly defined. Expanse of wings, ♂ 52 millim., ♀ 56 millim.

Zomba, July and December 1892, January 1893.

This appears to be a much commoner species than *J. micromera*, and is quite constant in all its characters.

37. Junonia micromera.

Junonia micromera, Butler, Ann. & Mag. Nat. Hist. ser. 4, vol. xviii. p. 482 (1876).

Lake Mweru; Zomba, July and December 1892, January 1893.

38. Junonia calescens, sp. n.

Precis octavia, Staudinger, Exot. Schmett. pl. 38. fig. 4.

omba, July 1892.

This species is commonly regarded as a variety of *J. octavia*, but there is not a particle of evidence in support of this opinion; in the present collection it is common and constant enough to justify its separation from Cramer's species. It differs as follows:— It is considerably larger (60–65 millim. in expanse), is of a bright rosy red colour, paler in the centre of the disk; all the black markings are less heavy in character, the bar at end of cell in primaries isolated, whereas in *J. octavia* it forms part of a broader and angular band which crosses the wing, and the marginal lunules on the under surface are bluish, instead of chalk-white. It is a constant local representative of *C. octavia*, which does not occur in the present collection.

39. Junonia elgiva.

Junonia elgiva, Hewitson, Exot. Butt. iii., *Jun.* pl. 1. fig. 1 (1864).

Lake Mweru; Zomba, December 1892 and January 1893.

40. Junonia cuama.

Junonia cuama, Hewitson, Exot. Butt. iii., *Jun.* pl. 1. figs. 4, 5 (1864).

Zomba, December 1892.

41. Junonia cloantha.

Papilio cloantha, Cramer, Pap. Exot. iv. pl. cccxxxviii. A, B (1782).

Lake Mweru; Zomba, December 1892.

42. Junonia actia.

Precis actia, Distant, P. Z. S. 1880, p. 185, pl. 19. fig. 7.

Lake Mweru.

43. Junonia sesamus.

Precis sesamus, Trimen, South Afr. Butt. i. p. 231, pl. iv. fig. 3 (1887).

Lake Mweru.

44. Junonia boöpis.

Junonia boöpis, Trimen, Trans. Ent. Soc. London, 1879, p. 331.

♂ ♀, Rhodesia, Lake Mweru, June 12, 1892.

45. Junonia clelia.

Papilio clelia, Cramer, Pap. Exot. i. pl. xxi. E, F (1779).

Lake Mweru; Zomba, January 1893.

46. Junonia cebrene.

Junonia cebrene, Trimen, Trans. Ent. Soc. London, 1870, p. 353.

Lake Mweru; Zomba, December 1892 and January 1893.

47. Pyrameis cardui.

Papilio cardui, Linnæus, Faun. Suec. p. 276, n. 1054 (1761).

Lake Mweru.

48. Protogoniomorpha definita.

♂. *Salamis definita*, Butler, Ann. & Mag. Nat. Hist. ser. 5, vol. iv. p. 230 (1879).

♀. Like a white form of *P. nebulosa*, but with the base of the wings above grey. Expanse of wings 76 millim.

Zomba, January 1893.

The male was described from Madagascar: we must therefore conclude either that three wide-ranging allied species exist, or that they represent one widely distributed and very variable species; the latter seems to me the more probable solution of the difficulty. In this case the present species would stand as *P. aglatonice*, Godt. (specimens of which we have received previously from Central Africa), and as var. *definita* ♀; *P. nebulosa* would also have to be ranked as an extreme form of the same species.

49. Protogoniomorpha anacardii.

Papilio anacardii, Linnæus, Mus. Lud. Ulr. p. 236 (1764).

Zomba, July 1892.

50. Cymothoe theobene.

Harma theobene, Doubleday, Westwood & Hewitson, Gen. Diurn. Lep. i. pl. 40. fig. 3 (1850).

Lake Mweru.

51. Hamanumida dædalus.

Papilio dædalus, Fabricius, Syst. Ent. p. 482, n. 174 (1775).

Lake Mweru; Zomba, July 1892.

52. Neptis agatha.

Papilio agatha, Cramer, Pap. Exot. iv. pl. cccxxvii. A, B (1782).

Lake Mweru; Zomba, July 1892.

53. Atella columbina.

Papilio columbina, Cramer, Pap. Exot. iii. pl. ccxxxviii. A, B, iv. pl. cccxxxvii. D, E (1782).

Zomba, December 1892 and January 1893.

54. Crenis natalensis.

Crenis natalensis, Boisduval, Voy. de Deleg. ii. p. 592 (1847).

Zomba, January 1893.

The single example is rather darker than the specimens in the Museum series, but differs in no other respect.

55. Crenis crawshayi, sp. n. (Plate LX. fig. 5.)

Greyish blue, the whole centre suffused with rosy lavender; the base and costa of primaries, and the body above, slightly greenish; wings with slightly sinuated black outer margins and delicate white fringes; veins black externally; disk of wings crossed by three series of black spots beyond the middle, the innermost series angulated and very oblique on the primaries, almost obliterated on the secondaries, the first two spots of the series cuneiform, the others rounded; second series double towards costa, the first three spots being preceded by elongate blackish streaks; a minute white dash between the first pair, which would otherwise be lost in the black veins, of which they form a mere thickening; the spot on interno-median area divided; submarginal series formed of more or less lunate spots; costa of secondaries and hairs on abdominal area somewhat brownish. Underside most like that of *C. rosa*, but deeper in colour, the primaries with two complete series of black spots towards outer margin, the first of the inner series and the first two of the outer series enclosed by a pale silvery blue apical costal streak, the three following pairs united by longitudinal streaks of the same colour, the fourth pair by a few blue scales; all the spots of the outer series united to pale blue marginal spots; extreme margin blackish, with white fringe: secondaries having the general aspect of those of *C. rosa*, but entirely different in details; costa broadly pale blue, with a black interrupted longitudinal line above the costal vein; a black spot below it at centre of costa and a cuneiform orange spot enclosing the precostal veinlet; a broad almost triangular blue patch nearly covering the cell, within which are black irregular characters similar to those of *Argynnis* or *Euthalia*; a blue streak runs down the abdominal border, and a second, enclosing the submedian vein, unites with it to form a large anal patch, which encloses a slender black submarginal line and the last two spots of the discal series; from the submedian streak a curved series of triangular blue spots, terminating externally in blackish angular markings, runs across to the cell, with the large patch on which the triangular spots are fused; two series of black spots parallel to the outer margin enclosed in clavate longitudinal pale blue streaks, the outer series submarginal. Body below bluish white. Expanse of wings 65 millim.

Lake Mweru.

A strikingly distinct new species.

56. Eurytela dryope.

Papilio dryope, Cramer, Pap. Exot. i. pl. lxxviii. E, F (1779).

Zomba, January 1893.

57. Hypanis acheloia.

Hypanis acheloia, Wallengren, Lep. Rhop. Caffr. p. 29 (1857).

Rhodesia, Lake Mweru, June 11, 1892; Zomba, July and December 1892.

58. Acræa vinidia.

Acræa vinidia, Hewitson, Ent. Mo. Mag. xi. p. 130 (1874); Exot. Butt. v., *Acræa*, pl. 7. figs. 45, 46 (1875).

Rhodesia, Lake Mweru, June 12, 1892.

59. Acræa cabira.

Acræa cabira, Hopffer, Ber. Verh. Akad. Berlin, 1855, p. 640, n. 7; Peters's Reise nach Mossambique, p. 378, pl. 23. figs. 14, 15 (1862).

Zomba, July 1892, January 1893.

60. Acræa excelsior.

Acræa excelsior, E. M. Sharpe, P. Z. S. 1891, p. 192, pl. xvii. fig. 3.

♀, Zomba, January 1893.

61. Acræa ventura.

Acræa ventura, Hewitson, Ent. Mo. Mag. xiv. p. 51 (1877).

♀. Above quite like a large reddish female of *A. eponina*[1]; primaries below with wider and comparatively paler apical area: the secondaries with three large vermilion spots in the macular central angulated band; the markings of the external border somewhat as in *A. cabira*, but only outlined in black, the zigzag line having much larger marginal triangular spots. Expanse of wings 60 millim.

Zomba, July 1892.

62. Acræa terpsichore.

Papilio terpsichore, Linnæus, Mus. Lud. Ulr. p. 222 (1764).

Papilio eponina ♀, Cramer, Pap. Exot. iii. pl. cclxviii. C, D (1782).

Zomba, July 1892.

My view (Fabr. Cat. p. 133) that *P. terpsichore* was *Acræa*

[1] According to Dr. Holland, who has gone carefully into the synonymy of the *A. serena* group (Ann. & Mag. N. H., October 1893), this is the typical *A. bonasia* of Fabricius, and Cramer's female the same as *A. serena*, Fabr. The only difficulty is that, in the absence of the Fabrician type of *A. serena*, his description is insufficient for the certain identification of the species, the only clue being "Parvus, affinis Terpsichori." In looking up the description of *P. terpsichore*, Linn., I find a reference to a figure by Petiver, which is clearly a bad representation of *Acræa violæ*; the Linnæan description "Apices fusci lunula in medio" corresponds much better with Cramer's female of *A. eponina*, which I believe to be *A. terpsichore*, Linn. Aurivillius, in his important paper on the species described by Linnæus, says: "fortasse ad *Acræa serena*, Fabr., optime referri posset, nisi alæ posticæ saturatiores essent."

horta is rightly opposed by Aurivillius; his hesitation to regard it as *A. serena*, Fabr., = *eponina* ♀, Cramer, seems to be based solely on the words "posticis saturatioribus," and is, I think, hypercritical: the question as to whether *A. serena* is the insect which it is generally supposed to be, in the absence of any mention by Fabricius of the oblique spot on the black at apex, is, I think, far more doubtful. My remark (*loc. cit.*) that the Linnæan description "is applicable to *A. rahira* ♀" appears on more mature reflection to be untenable.

63. Acræa perrupta.

Telchinia perrupta, Butler, Ann. & Mag. Nat. Hist. ser. 5, vol. xii. p. 102, n. 4 (1883).

Lake Mweru; Zomba, July 1892.

64. Acræa lycia.

Papilio lycia, Fabricius, Syst. Ent. p. 464, n. 94 (1775).

Lake Mweru.

A. adrasta, Weymar (Stett. ent. Zeit. 1892, p. 85), is the allied *A. cæcilia*.

65. Acræa doubledayi.

Acræa doubledayi, Guérin, Lefebvre's Voy. en Abyss. vi. p. 378 (1847).

Acræa oncæa, Hopffer, Peters's Reise, v. pl. 24. figs. 5–8 (1862).

♀, Lake Mweru; ♂ ♀, Zomba, July 1892.

I believe *A. abadina*, Ribbe, to be this species.

66. Acræa empusa, sp. n. (? local race of *A. asema*, Hewits.)

Allied to *A. doubledayi*, with the aspect of *A. punctatissima*. Sexes nearly alike, semitransparent, tawny; the primaries greyer than the secondaries, with diffused black apical patch; the spots nearly as in *A. doubledayi*, but the primaries with three additional spots in an oblique series below apex; secondaries with marginal tawny spots on the black border. Primaries below with three more or less distinct yellowish-white apical marginal spots on a diffused grey apical nebula; four spots instead of three in the oblique series beyond the cell; no white subapical band in the female, the three additional black spots as above: secondaries with the black spots wider apart, larger and less numerous; rose-colour and spots at base similar, no spot on upper radial interspace, the dot at base of lower radial interspace wanting, and the large spot placed nearer to the base; only one spot on abdominal margin. Expanse of wings, ♂ 46 millim., ♀ 47 millim.

Zomba, July 1892.

One crippled male example has an expanse of 50 millim.

A similar but distinct species is described by Rogenhofer under the name of *A. marnois*.

67. Acræa periphanes.

Acræa periphanes, Oberthür, Études d'Entom. livr. xvii. p. 20, pl. 2. fig. 23 (1893).

One example, Lake Mweru.

Our example is better marked than that of M. Oberthür, all the spots of the under surface of primaries being strongly defined on the upper surface; the secondaries below more distinctly marked with rosy vermilion on abdominal border, where there is one additional black spot. There can be no question whatever that these differences are due to simple individual variation.

In the same livraison M. Oberthür has described a number of species as new upon which Dr. Holland has recently commented in his paper in the 'Annals of Natural History.' I quite agree with him in his statement that all the varieties of *A. proteina* and *A. kilimandjara* are sports of *A. johnstoni*, Godman. I also consider *A. cappadox* to be=*A. bonasia*, *A. strattipocles* ♂ = *sambavæ*, Ward; *A. conradti*=probably a variety of *A. fornax*, Butl.; *A. serena-melas* a melanism of *A. bonasia*; *A. chæribula*= n. sp. near to *A. caldarena*; *A. masaris* ♀ =*A. monteironis*, Butl. *A. regalis* is allied to, but distinct from, *A. bræsia*, Godm. We have the species represented in the Museum collection.

Of other *Acræas* recently described to which attention should be drawn are *A. albomaculata*, Weymar, Stett. ent. Zeit. 1892, p. 82, which is=*A. ligus*, Druce, and *A. ombria*, Weymar, *l. c.*, which is =*A. caldarena*, Hew.

68. Acræa caldarena.

Acræa caldarena, Hewitson, Ent. Mo. Mag. xiv. p. 52 (1877).

Acræa nelusca, Oberthür, Études, livr. iii. p. 25, pl. 2. figs. 2, 3 (1878).

Acræa amphimalla, Westwood in Oates's 'Matabele-Land,' pl. E. figs. 1, 2 (1881).

Acræa ombria, Weymar, Stett. ent. Zeit. 1892, p. 82.

♂ ♀, Zomba, July 1892; ♂, Lake Mweru.

I cannot agree with Trimen in referring *A. nelusca* to *A. doubledayi*: in the first place the male, although with a slightly smaller black apical patch than usual to the primaries, also lacks the longitudinal grey streaks on the internervular folds, which are very characteristic of *A. doubledayi* ♂; the female, moreover, is quite typical, and, as Trimen says, in it "there is no trace whatever of the subapical whitish bar of *doubledayi* ♀." In the present collection one female corresponds with Oberthür's figure, whilst another is smoky grey, with the central third of the primaries occupied by a broad oblique snow-white belt.

69. Acræa acrita.

Acræa acrita, Hewitson, Exot. Butt. iii., *Acr.* pl. 3. fig. 18 (1865).

♂, Lake Mweru.

70. Acræa guillemei.

♂. *Acræa guillemei*, Oberthür, Études, livr. xvii. p. 19, pl. 1. fig. 1 (1893).

♀. Smoky grey, with black borders and spots as in the male.

Zomba, July 1892 and January 1893.

This species, with its dusky female, is rather strikingly distinct; it does not appear to be rare.

71. Acræa natalica.

Acræa natalica, Boisduval, Voy. de Deleg. p. 590, n. 57 (1847).

♂ ♀, Zomba, July 1892; Lake Mweru.

72. Acræa arcticincta.

Acræa arcticincta, Butler, Ann. & Mag. Nat. Hist. ser. 5, vol. xii. p. 103 (1883).

Acræa anemosa, Staudinger, Exot. Schmett. pl. 33. fig. 1.

Zomba, July 1892.

As I pointed out in my description, the black border of the secondaries in this *Acræa* is only half the width of that in *A. anemosa*; the black oblique streak at the end of the cell of primaries is also narrower; it is a well-marked representative form, between which and the species named by Hewitson I have seen no links.

73. Acræa areca.

Acræa areca, Mabille, Bull. Soc. Ent. France, 1888; Nov. Lep. p. 100, pl. xiv. p. 5 (1893).

Acræa khara, Grose Smith, Ann. & Mag. Nat. Hist. ser. 6, vol. iii. p. 128 (1889); Rhop. Exot., *Acr.* pl. 2. figs. 1, 2 (1889).

♂, Zomba, July 1892; ♀, December 1892.

The female has a pale subapical white patch immediately beyond the black oblique bar after end of cell of primaries.

74. Acræa acara.

Acræa acara, Hewitson, Exot. Butt. iii., *Acr.* pl. 3. figs. 19, 20 (1865).

♀. Var. *Acræa pseudolycia*, Butler, Cist. Ent. i. p. 213 (1874).

♂ ♀, Zomba, July 1892.

A. pseudolycia is a rare albino form of the female.

75. Planema johnstoni.

♂. *Acræa johnstoni*, Godman, P. Z. S. 1885, p. 537.

♀. *Acræa* (*Planema*) *johnstoni*, Butler, P. Z. S. 1888, p. 91.

♀ ♀, Zomba, December 1892 and January 1893.

As already stated, Dr. Holland has given the full synonymy of this species, which is more variable in colouring than any other *Planema*. I have seen examples in various collections corr sponding with most of those figured by M. Oberthür.

76. Alæna nyassa.

Alæna nyassa, Hewitson, Ent. Mo. Mag. xiv. p. 6 (1877).

♀. *Alæna major*, Oberthür, Études, livr. xii. p. 7, pl. 2. fig. 5 (1888).

Zomba, December 1892 and January 1893.

It is a singular thing that, at the time when M. Oberthür described and figured his *A. hauttecœuri* and *A. major* and made the observation,—" Jusqu'à présent on ne connaissait d'autre espèce du genre *Alæna* que l'*Amazoula*, Bdv., de Natal,"—one of these species had already been described eleven years, as *A. nyassa*, and the other five years, as *A. interposita*: one does not wish to be severe, but it looks almost as though this author had not gone over his 'Zoological Records' with any great care.

76 *a*. Alæna nyassa, var. ochracea.

Similar in pattern to the type, but the belt across the centre of the wings buff-coloured in the male and wider than in the typical form; that of the female cream-coloured, wider on costa than in the typical female, and less inarched; wings below suffused with buff. Expanse of wings, ♂ 31–36 millim, ♀ 35–36 millim.

Zomba, December 1892 and January 1893.

It is just possible that this may prove to be distinct from *A. nyassa*, but I am rather inclined to believe it to be a dimorphic form corresponding with the ochreous male of *A. interposita*, figured by M. Oberthür as the male of his *A. hauttecœuri*.

77. Alæna amazoula.

Alæna amazoula, Boisduval, Voy. de Deleg. ii. p. 591 (1849).

Zomba, July 1892.

78. Tingra amenaida.

Pentila amenaida, Hewitson, Exot. Butt. v., *Pent.* & *Lipt.* pl. 2. figs. 4–7 (1873).

Zomba, July 1892.

Var. Base of primaries dusky; secondaries smoky brown, with black spots and borders as usual.

Zomba, July and December 1892.

79. Lachnocnema bibulus.

Hesperia bibulus, Fabricius, Ent. Syst. iii. 1, p. 307, n. 163 (1793).

Zomba, July and December 1892.

This species varies considerably in size.

80. Hyreus lingeus.

Papilio lingeus, Cramer, Pap. Exot. iv. pl. cccl xxix. F, G (1782).

Zomba, July 1892.

81. Zizera gaika.

Lycæna gaika, Trimen, Trans. Ent. Soc. ser. 3, vol. i. p. 403 (1862).

Zomba, July 1892.

82. Lycænesthes bubastus.

Papilio bubastus, Cramer, Pap. Exot. iv. pl. cccIxii. G, H (1782).

Zomba, July 1892.

83. Lycænesthes adherbal?

♀. *Lycæna adherbal*, Mabille, Bull. Soc. Zool. France 1877, p. 217.

Zomba, July and December 1892.

This species is nearest to *L. princeps*, Butl.; the description is imperfect, having been made from a damaged female example; there can therefore be no absolute certainty in its identification excepting by a comparison with the type. The male of the species before me is less brilliantly coloured than the female: shining lavender blue above; the apical area and outer border of primaries dark brown, as also the costal area and sometimes a marginal border on the secondaries; the orange-zoned ocelli are slightly smaller than in the female.

84. Catochrysops osiris.

Lycæna osiris, Hopffer, Ber. Verh. Ak. Berlin, 1885, p. 642, n. 21; Peters's Reise nach Mossamb. v. p. 409, pl. 26. figs. 11, 12 (1862).

Zomba, July 1892 and January 1893.

85. Catochrysops asopus.

Lycæna asopus, Hopffer, Ber. Verh. Ak. Berlin, 1855, p. 642, n. 22; Peters's Reise nach Mossamb. v. p. 410, pl. 26. figs. 13–15 (1862).

Zomba, July 1892.

86. Castalius hypoleucus, sp. n.

♂. Pale smoky grey, with darker veins and undulated submarginal line: primaries with transverse narrow dusky discocellular bar; an arched or angulated discal series of spots showing through the wing; a blackish marginal line: secondaries with discoidal and discal spots visible through the wing; a marginal series of ocelloid spots, bounded internally by the undulated line; the last but one distinct, blackish, crossed by a few bluish scales; the last or subanal ocellus double, sometimes blackish, but not invariably; all the others indistinct; margin black, preceded near anal angle by a slender white line; body blackish. Under surface chalky or creamy white, with greyish veins; a slender marginal black line, fringe brown, tipped with white: primaries with a short black bar on the discocellulars, an arched or angulated series of five brown or black spots across the disk from fourth subcostal to first

median branch; a submarginal series of almost confluent olive-brown dashes; secondaries with three rounded black equidistant spots across the basal area, a black discocellular bar and a double arched series of eight black spots across the disk; a submarginal undulated line, the first four divisions of which are olive-brown and the remainder saffron-yellow; beyond this line is a series of more or less defined pale yellow spots, succeeded near anal angle by a single black spot crossed by a metallic blue crescent, a double black spot sprinkled with metallic blue scales, and a black dot in the angle itself; body below white. Expanse of wings 40–43 millim.

♀. Larger than the male, the basal area sometimes to beyond the middle suffused with lilac; a large black spot at the end of the discoidal cell of primaries; primaries below with an additional black discal spot; in other respects like the male excepting that the female from Zomba has the discocellular bar and the spots at centre of discal series on the secondaries well-defined in black on the upper surface. Expanse of wings 47–54 millim.

♂ ♂, Forests of Tiveta and Wasin in coll. B.M. ♀ ♀, Victoria Nyanza and Zomba; the former in the Museum, the latter in the present series.

I have long hesitated to describe this very distinct species on account of the more or less damaged condition of all the specimens, and I had hoped Mr. Grose Smith would long since have relieved me from the necessity of doing so, but this I cannot discover that he has done. The species appears to me to come nearest to *C. azureus* from Madagascar, of which it is possible that *C. leucon*, Mab., may be the female, in spite of the extraordinary difference of pattern on the under surface of the primaries.

87. Azanus natalensis.

Lycæna natalensis, Trimen, South Afr. Butt. ii. p. 77, n. 158 (1887).

Zomba, July 1892.

88. Tarucus pulcher.

Lycæna pulchra, Murray, Trans. Ent. Soc. 1874, p. 524, pl. 10. figs. 7, 8.

Zomba, July and December 1892, January 1893.

89. Tatura philippus.

Hesperia philippus, Fabricius, Ent. Syst. iii. 1, p. 283, n. 87 (1793).

♀, Zomba, January 1893.

90. Tatura cæculus.

Iolaus cæculus, Hopffer, Ber. Verh. Ak. Berlin, 1855, p. 642, n. 17; Peters's Reise nach Mossamb. v. p. 402, pl. 25. figs. 12–14 (1862).

♀, Zomba, January 1893.

91. Virachola anta.

Lycæna anta, Trimen, Trans. Ent. Soc. ser. 3, vol. i. p. 402 (1862).

♂, Zomba, December 1892 and January 1893.

92. Spindasis nyassæ.

Aphnæus nyassæ, Butler, Ent. Mo. Mag. xx. p. 250 (1884).

♀, Zomba, December 1892.

A much damaged example, but corresponding exactly in under-surface pattern with the male.

93. Spindasis homeyeri.

Aphnæus homeyeri, Dewitz, Deutsche ent. Zeitschr. xxx. p. 429, pl. 2. figs. 5 *a–c* (1886).

Zomba, December 1892.

In the plate the coloration of the upper surface is a little too florid; in fact, the upper surface is not unlike that of *Spindasis natalensis*; the pattern of the under surface at once fixes the species.

94. Axiocerses amanga.

Zeritis amanga, Westwood in Oates's 'Matabele-Land,' p. 351, n. 62 (1881).

Lake Mweru; Zomba, July 1892.

95. Axiocerses harpax.

Papilio harpax, Fabricius, Syst. Ent. App. p. 829, n. 327–8 (1775).

Lake Mweru; Zomba, July 1892 and January 1893.

96. Axiocerses perion.

Papilia perion, Cramer, Pap. Exot. iv. pl. cclxxix. B, C (1782).

Zomba, July and December 1892.

It appears to me that Hübner has as much claim to the genus *Axiocerses* as Felder has to the majority of the genera indicated by him in the 'Reise der Novara.'

97. Mylothris agathina.

Papilio agathina, Cramer, Pap. Exot. iii. pl. ccxxxvii. D, E (1782).

♂ ♀, Lake Mweru; ♀, Zomba, December 1892 and January 1893.

As I have explained elsewhere, the genus *Mylothris* is readily separable from *Belenois*, not only by its slightly longer wings, but as having only four branches to the subcostal vein of primaries. When describing *Belenois welwitschii*, Herr Rogenhofer recognizes the fact, mentioning "die gegabelte Apicalader" as a distinguishing character of the genus *Belenois*; nevertheless, in the same paper (Ann. Nat. Hofmuseums, Wien, 1889, pl. xxiii.), he has figured *Belenois ianthe* under the new name of *Mylothris agylla*, Rgh., and *Phrissura phaola* as also a *Mylothris*. His *B. welwitschii* comes

near to *B. calypso* and might almost be a hybrid between that species and *B. sabrata=thysa*, var.; the description is based upon two examples, both of them males.

98. Mylothris rüppelli.

Pieris rüppellii, Koch, Indo-Austr. Lep. Fauna, p. 88 (1865).

♀, Zomba, January 1893.

99. Nychitona alcesta.

Papilio alcesta, Cramer, Pap. Exot. iv. pl. cccl xxix. A (1782).

Lake Mweru.

100. Colias edusa.

Papilio edusa, Fabricius, Mant. Ins. ii. p. 23, n. 240 (1787).

♀, Zomba, December 1892.

101. Terias zoe.

Terias zoe, Hopffer, Ber. Verh. Ak. Berlin, 1855, p. 640, n. 5; Peters's Reise nach Mossamb. v. p. 369, pl. 23. figs. 10, 11 (1862).

♀, Zomba, January 1893.

102. Terias regularis.

Terias regularis, Butler, Ann. & Mag. Nat. Hist. ser. 4, vol. xviii. p. 486 (1876).

♂ ♀, Zomba, July and December 1892.

103. Terias orientis.

Terias orientis, Butler, P. Z. S. 1888, p. 71, n. 87.

Terias butleri, Trimen, Afr. Butt. iii. p. 23, n. 244 (1889).

♂, Lake Mweru; ♀, Zomba, July 1892.

I had suspected the identity of *T. orientis* and *T. butleri* ever since reading the description of the latter, and in 1891 Mr. C. Barker kindly gave us a typical example of *T. butleri* from Palapye, Kama's country, Mashonaland, enabling me to prove the fact beyond question.

104. Teracolus rhodesinus, sp. n. (Plate LX. fig. 6.)

♂. Intermediate in character between *T. vesta* and *T. catochrysops*. Upper surface creamy buff, with white basal third and blue-grey basal scaling: primaries with slender black costal margin; discocellular spot large and black as in *T. mutans*; the external border nearly as in *T. doubledayi*, only the veins are not black beyond the bisinuated inner band of the black-brown external area: secondaries with the inner band or edging of the external area very narrow and almost obliterated below the third median branch, the outer border also narrow as in *T. doubledayi*, but more sharply defined; the enclosed spots consequently are longer than usual. Below like *T. vesta*, but the primaries with the bisinuated 3-band narrower and the secondaries of a more lively sulphur-yellow tint,

with saffron-yellow veins on basal area. Expanse of wings 45 millim.

Rhodesia, Lake Mweru, October 17, 1892.

105. Teracolus phlegyas.

Anthocharis phlegyas, Butler, P. Z. S. 1865, p. 431, pl. 25. figs. 3, 3*a* (1865).

♂, Salim bin Najimb, Konde, January 18, 1893 (*R. C.*).

106. Teracolus anax.

Callosune anax, H. Grose Smith, Ann. & Mag. Nat. Hist. ser. 6, vol. iii. p. 125 (1889); Rhop. Exot. i., *Call.* pl. 1. figs. 5–8 (1889).

♀, Lake Mweru.

107. Teracolus theogone.

Anthocharis theogone, Boisduval, Sp. Gén. Lép. i. p. 575, n. 23 (1836).

♂ ♀, Lake Mweru.

108. Teracolus subvenosus.

Teracolus subvenosus, Butler, Ann. & Mag. Nat. Hist. ser. 5, vol. xii. p. 105, n. 10 (1883).

♂, Zomba, July 1892.

109. Teracolus omphale.

Pieris omphale, Godart, Enc. Méth. ix. p. 122, n. 12 (1819).

♂, Lake Mweru.

110. Catopsilia florella.

Papilio florella, Fabricius, Syst. Ent. p. 479, n. 159 (1775).

♀, Zomba, July 1892.

111. Catopsilia pyrene.

Colias pyrene, Swainson, Zool. Ill. i. pl. 51 (1820–21).

♂ ♀, Zomba, July and December 1892.

112. Belenois severina.

Papilio severina, Cramer, Pap. Exot. iv. pl. cccxxxviii. G, H (1782).

♀, Rhodesia, Lake Mweru, June 13, 1892.

113. Belenois agrippina.

Pieris agrippina, Felder, Reise der Nov., Lep. ii. p. 173, n. 159 (1865).

♂, Lake Mweru; ♀, Zomba, July 1892.

Personally I have no doubt that Felder's *Pieris agrippina* is the large African representative of *B. mesentina*, with blackish-brown veins on under surface of secondaries. My friend Trimen's attempt to convince us that it is a varietal form of *B. severina* seems to me to be a work of supererogation: we have an abundant

African species, which agrees with Felder's description closely enough (I should have imagined) to satisfy anyone; but, probably because the base of the front wings on the under surface is said to be tinted with sulphur (a character only faintly indicated at the base of the costal border in the males), it is regarded as a variety of *B. severina*. Felder, comparing his *Pieris agrippina* with the latter species, rightly observes that it has the costal margins of the wings longer and the cells longer and narrower; he also notes that the white spots on the black apical area of the primaries are tolerably large, the inner edge of the outer border of the secondaries squamose, and the veins on the under surface of the same wings violaceous brownish, none of which characters are found in typical *B. severina*, nor have I ever met with a variety of that species possessing them. *B. lordaca* is, as Trimen observes, doubtless the same species as *B. mesentina*; but as to *B. auriginea* being the spring brood, Col. Yerbury's collection rather tended to show that it prevailed in the autumn, if I remember rightly.

114. Belenois gidica.

Pieris gidica, Godart, Enc. Méth. ix. p. 131, n. 37 (1819).

♀, Lake Mweru.

115. Belenois crawshayi, sp. n.

♂. Allied to *B. zochalia*. Above greenish white: primaries with silvery sericeous base; costal margin slenderly edged with black; the external border formed as in *B. calypso*, but rather more decided and without the apical white streak between the first and second spots; the five spots which remain quite white, the first, third, and fifth small and sagittate, the second larger and pyriform, the fourth minute and squamose; a very conspicuous black spot on the lower discocellular veinlet: secondaries with well-defined marginal black spots. Primaries below with the apical area pale sulphur-yellow, crossed by olive-brown veins and edged internally from costa to lower radial vein by an irregular narrow band of the same colour, below this by a grey lunule which connects it with a triangular black spot on second median interspace; black discocellular spot as above: secondaries creamy sulphur, with basal third of costal margin and a short interno-median basal streak of saffron- or cadmium-yellow; the veins, a forked marking in the cell, an oblique bar on the lower discocellulars, two or three squamose streaks across the base of the interno-median and first median areas, a partly disconnected zigzag submarginal stripe, and a series of broadly triangular marginal spots pale olive-brown; fringe white, spotted with grey and tipped with black at the extremities of the median branches: body below creamy whitish, the palpi pure white. Expanse of wings 63 millim.

Lake Mweru.

We have two males of this species in the Museum from Lake Tanganyika.

116. Belenois diminuta, sp. n. (Plate LX. fig. 7.)

♀. Allied to the preceding species; considerably smaller; the white spots on apical area enlarged, almost confluent, so as to divide it into an inner irregular oblique black band; a quadrate black spot on second median interspace and a dentated grey-brown external border, widest at apex; the black discocellular spot rather smaller than in *B. crawshayi* and the silvery basal area of wider extent: secondaries immaculate, the fringe slightly brownish: apical area below testaceous, the oblique band and quadrate spot of the upper surface represented in brownish grey, but the outer border obliterated: secondaries dull creamy stramineous, whiter on the veins; a faintly indicated testaceous spot on the lower discocellular and two or three very indistinct testaceous Λ-shaped markings representing the submarginal line of the preceding species. Expanse of wings 50 millim.

Lake Mweru.

I should have preferred to regard *B. diminuta* as the female of *B. crawshayi*, but females in this genus are usually as large as or larger than males and always have better defined markings; that there should be a solitary exception to this rule seems in the highest degree improbable.

117. Herpænia eriphia.

Pieris eriphia, Godart, Enc. Méth. ix. p. 157, n. 134 (1819).

Rhodesia, Lake Mweru, June 12, 1892.

118. Glutophrissa saba.

Papilio saba, Fabricius, Spec. Ins. ii. p. 46, n. 199 (1781).

♂ ♀, Lake Mweru.

119. Nepheronia thalassina.

Pieris thalassina, Boisduval, Sp. Gén. i. p. 443, n. 8 (1836).

♂, Lake Mweru.

120. Eronia leda.

Eronia leda, Doubleday, Gen. Diurn. Lep. i. p. 65 (1847).

♂, Lake Mweru.

121. Eronia cleodora.

Eronia cleodora, Hübner, Samml. exot. Schmett. ii. pl. 130 (1816–36).

Lake Mweru.

Herr Weymar (Stett. ent. Zeit. 1892) has redescribed my *E. dilatata* under the name of *E. cleodora*, var. *marginata*.

122. Papilio lurlinus.

Papilio lurlinus, Butler, Ann. & Mag. Nat. Hist. ser. 5, vol. xii. p. 106, n. 12 (1883).

Mipa stream, Mofwi, August 3, 1892 (*R. C.*).

The type of this species was received from the Victoria Nyanza.

123. Papilio leonidas.

Papilio leonidas, Fabricius, Ent. Syst. iii. 1, p. 35, n. 103 (1793).

Zomba, December 1892.

124. Papilio corinneus.

Papilio corinneus, Bertoloni, Mem. Acc. Bologna, 1849, p. 9, pl. 1. figs. 1–3.

Zomba, July 1892.

125. Papilio nivinox, sp. n.

Black-brown, with semitransparent snow-white markings above; general character of markings similar to those of *P. corinneus*, excepting that the large spot near the end of the cell and the small one beyond it are so much enlarged that an oblique black line alone divides them, that the oval spot above the third median branch is lengthened and widened so as to form an oblique belt with the above-mentioned discoidal spots, from which it is only separated by the black median vein; that the large patch in the lower (first) median interspace is represented by a large or small oval patch occupying the centre af the interspace; the two subapical spots are rounded and well separated, and, as already mentioned, all the white markings are snow-white, whereas in *P. corinneus* they are greenish white: on the under surface the crimson in the cell is deeper and only occupies the basal half, the outer half of the cell being jet-black; the apical area is deep rufous-brown; the abdominal area of the secondaries is deep crimson to the first median branch; the ochreous spot is obliquely truncated internally; the external area extends inwards so as to fill the second median interspace, and within the cell it extends upwards along the base of the second subcostal branch; instead of being ochreous with a reddish clay-coloured band from the ochreous anal spot, it is reddish clay-coloured with a black band; as above also the markings are snow-white instead of greenish. Expanse of wings 85 millim.

Two examples, Lake Mweru.

This is a far more beautiful species than *P. corinneus*, the contrasts of colouring on both surfaces being much more defined and tasteful; in point of form it differs in the slightly less inarched outer margin of the primaries and more regularly rounded outer margin of the secondaries.

126. Papilio demoleus.

Papilio demoleus, Linnæus, Mus. Lud. Ulr. p. 214 (1764).

Lake Mweru; Zomba, December 1892.

127. Papilio ophidicephalus.

Papilio ophidicephalus, Oberthür, Études, iii. p. 13 (1878).

Lake Mweru.

128. Papilio constantinus.

Papilio constantinus, Ward, Ent. Mo. Mag. viii. p. 34 (1871); Afr. Lep. p. 1, pl. 1. figs. 1, 2 (1873).

Lake Mweru.

129. Papilio merope.

Papilio merope, Cramer, Pap. Exot. ii. pl. cli. A, B (1779).

♂, Rhodesia, Lake Mweru, June 11, 1892.

130. Papilio erinus.

Papilio erinus, Gray, Cat. Lep. Ins. B. M. i. p. 35, n. 127 (1865).

Lake Mweru; Zomba, December 1892 and January 1893.

The Hesperiidæ in the collection are numerous, and so many species have been described of late years, especially by Herr Plötz and Monsieur Mabille, that it has been no light task to work carefully through the accumulation of literature and decide what species are new to science. That the descriptions of Plötz are not easy to follow is a fact, I think, pretty generally admitted, and those who have attempted to recognize his species have not always succeeded in making them evident to their successors. For instance, Herr Ribbe ('Isis,' 1889, p. 261), after quoting the description of *Pamphila ahrendti*, observes :—"It is very difficult, from this short description of Plötz's, to identify *P. ahrendti*. I have therefore had the species figured, by which figure the identification can be gained with certainty." Unhappily, this is far from being a fact, as the figure is a blotchy photolithograph, and might stand for any Hesperiid of the same size; in short, it is utterly useless as an aid to identification. It is a pity that so little work equal to that of Prof. Aurivillius has been produced in Germany, and so little as lucid as that of the late Monsieur Guenée in France. One of the chief difficulties in the identification of Mabille's Hesperiidæ consists in the fact that his new species are frequently placed in the wrong genera.

131. Tagiades flesus.

Hesperia flesus, Fabricius, Spec. Ins. ii. p. 135, n. 621 (1781).

Zomba, December 1892 and January 1893.

132. Sarangesa motozi.

Pterygospidea motozi, Wallengren, Kongl. Svensk. Vet.-Akad. Handl. 1857, p. 53.

Lake Mweru; Zomba, January 1893.

133. Sarangesa motozoides?

Sarangesa motozoides, Holland, Ann. & Mag. Nat. Hist. ser. 6, vol. x. p. 288, n. 9 (1892).

Lake Mweru.

134. Sarangesa astrigera, sp. n.

Black-brown, with a faint cupreous gloss; fringes spotted with greyish white; a submarginal series of snow-white dots; indications of a discal series of smaller dots, best defined on the primaries; a minute spot in each discoidal cell; primaries also with two widely separated white points on interno-median area and three small spots in the form of a < beyond the cell: abdomen above black; antennæ black, ringed with white. Wings below more distinctly shot with cupreous than above, in some lights varying to bronzy green; the white dots on primaries nearly as above, but those on secondaries better defined and forming four imperfect series, consisting respectively of two, five, seven, and eight or nine white dots; fringes spotted as above: palpi white below; body greyish. Expanse of wings 33 millim.

Zomba, January 1893.

135. Caprona pillaana.

Caprona pillaana, Wallengren, Kongl. Svensk. Vet.-Akad. Handl. 1857, p. 51; Trimen, South Afr. Butt. pl. xii. figs. 6, 6 *a* (1889).

Zomba, January 1893.

136. Caprona jamesoni.

Antigonus jamesoni, E. M. Sharpe, Ann. & Mag. Nat. Hist. ser. 6, vol. vi. p. 348 (1890).

Pterygospidea jamesoni, Trimen, P. Z. S. 1891, p. 106, pl. ix. fig. 25.

Mipa stream, Mofwi, August 3, 1892 (*R. C.*).

137. Hesperia dromus.

Pyrgus dromus, Plötz, Mitth. naturw. Vereins, 1884, p. 6, n. 13.

Lake Mweru; Zomba, July and December 1892, January 1893.

138. Acleros philander.

Pamphila philander, Hopffer, Monatsber. Kön. Akad. Wiss. Berlin, 1855, p. 643; Peters's Reise nach Mossamb. v. p. 416, pl. 27. figs. 1, 2 (1862).

Zomba, July 1892.

139. Acleros placidus.

Apaustus placidus, Plötz, Stett. ent. Zeit. 1879, p. 360.

Zomba, December 1892 and January 1893.

140. Oxypalpus ruso.

Pamphila ruso, Mabille, Comptes Rendus Soc. ent. Belge, 1891, clxxxiii.

Zomba, December 1892.

The description of the upper surface of primaries seems rather

vague, but I think, from the striking character of the under-surface markings, there can be little doubt that this is Mabille's species; the upper surface appears to be not much unlike the *Pamphila gisgon* of the same author.

141. Osmodes ranoha.

Pamphila ranoha, Westwood in Oates's 'Matabele-Land,' p. 353 (1881).

Zomba, December 1892 and January 1893.

The Hewitson collection contains two specimens unnamed, labelled "Zanzibar" and "Nyassa" respectively.

142. Heteropterus formosus, sp. n. (Plate LX. fig. 8.)

Black-brown, with an angular ochreous subapical band, constricted or divided at third median branch, and a small spot of the same colour near external angle; secondaries with six submarginal ochreous spots, the fringe usually varied with the same colour; the head and thorax more or less clothed with dull ochraceous hairs: primaries below dark cupreous brown, almost black; costal margin sprinkled with pale yellowish scales; a subcostal longitudinal streak, followed below origin of first subcostal branch by a spot; a shorter streak in the cell; a minute transverse spot at end of cell; the angular band and spot of upper surface bright ochreous; internervular folds terminating in a marginal series of more or less triangular pale yellow spots; outer edge of fringe slightly varied with yellow at apex: secondaries milk-whitish, the submedian interspace pale sordid yellow, traversed towards anal angle by a looped blackish line from submedian vein; all the veins black; a large subbasal oblong spot linking the costal and subcostal veins, an irregular central band from second subcostal branch to submedian vein, and a submarginal macular band, consisting of seven divisions, bright ochreous, edged with black; fringe black, almost wholly tipped with ochreous: palpi below black at base, their fringes at first whitish, then reddish ochreous, faintly tipped with black; pectus and legs clothed with ochreous hair; venter black, with ochreous spots at the sides, creamy white in the centre. Expanse of wings 33–36 millim.

Zomba, December 1892 and January 1893.

Evidently this beautiful species is not rare.

143. Cyclopides quadrisignatus, sp. n. (Plate LX. fig. 9.)

Intermediate between *C. metis* and *ægipan*; purplish brown; a sinuous transverse spot at end of cell, two obliquely placed trifid subapical spots and a larger bifid spot cut by the second median branch, ochreous; a few very short ochreous bristles below the median vein: secondaries with a few fine ochreous hairs in the cell; a bifid spot at end of cell, a smaller squamous spot below apex and another in first median interspace ochreous: body blackish; antennæ ringed with white, club more or less ochreous.

Wings below cupreous brown; primaries with the ochreous spots larger and brighter than above, that of end of cell deeply incised internally; secondaries immaculate. Expanse of wings 31–35 millim.

Zomba, December 1892 and January 1893.

Two somewhat damaged specimens of this distinct species, which at the first casual examination I mistook for *C. malgacha*, from which, however, they are abundantly distinct.

144. Cyclopides midas, sp. n.

Allied to *C. metis*, chiefly differing above in the much greater size and more golden orange colouring of all the spots; there is, however, a well-defined short orange streak below the costa near the base, a nearly complete belt of subbasal spots crossing the wings obliquely; below all the spots are as well defined as above but rather paler, whereas in *C. metis* the under surface of the secondaries is almost immaculate in the female and quite so in the male. Expanse of wings 30 millim.

Zomba, July 1892.

In the Hewitson collection a specimen from Nyasa is associated with *C. metis*, and in the Museum collection is a second specimen, from Victoria Nyanza.

145. Padraona watsoni, sp. n.

Resembles *Telicota bambusæ* of Moore; decidedly larger and rather brighter in colouring; the oblique black band on the primaries with its outer edge acutely produced at first median branch, as in some other species of *Padraona*, though this band does not run inwards to the base; the inner branch of the furca also carried forwards to costa; the outer border, however, has an irregularly zigzag inner edge; the base is greyish green, with a black spot, ill-defined in the male, near the base of the cell, and the male has basal black streaks on costal and internal borders; the ground-colouring of the female is much yellower than that of the male: the pattern of the under surface, but especially on the secondaries, is very similar to that of *Telicota bambusæ*, but the costal border of the primaries is bright yellow, with the differences in the darker markings mentioned as occurring on the upper surface; the secondaries are bright yellow, with the greyish areas of *T. bambusæ* replaced by greenish; the blackish anal patch well-defined in the male, subquadrate, bounded internally and at anal angle by golden orange; the blackish submarginal spot well-defined and continued to costa; the short greyish central band spotted with blackish, and several smaller spots across the basal area; costa greyish. Expanse of wings 40 millim.

Zomba, ♂ July 1892, ♀ January 1893.

It seems to me that generic distinctions employed for species bearing so close a resemblance to one another as the present insect and *Telicota bambusæ* are somewhat arbitrary and not altogether satisfactory; but the Hesperiidæ are such a difficult

family that any characters which will divide the groups of species are welcome.

146. GEGENES LETTERSTEDTI.

Hesperia letterstedti, Wallengren, Kongl. Svensk. Vet.-Akad. Handl. 1857, p. 49, n. 3.

Zomba, July 1892 and January 1893.

147. BAORIS FATUELLUS.

Pamphila fatuellus, Hopffer, Monatsber. K. Akad. Wiss. Berlin, 1855, p. 643, n. 25; Peters's Reise nach Mossamb. v. p. 417, pl. 27. figs. 3, 4 (1862).

Lake Mweru; Zomba, July and December 1892, January 1893.

148. BAORIS INCONSPICUA.

Hesperia inconspicua, Bertoloni, Mem. Acc. Bol. 1849, p. 15.

Pamphila inconspicua, Hopffer, Peters's Reise nach Mossamb. v. p. 418 (1862).

Zomba, July 1892.

149. BAORIS AMADHU?

Pamphila amadhu, Mabille, Comptes Rendus Soc. ent. Belge, p. lxxviii (1891).

Zomba, December 1892 and January 1893.

I believe I have correctly identified this species.

150. HALPE NIGERRIMA, sp. n.

Black-brown; the primaries with strong bronze reflections; eight hyaline white spots as follows—two small, fusiform, superposed in the cell, a large quadrate spot below them on first median interspace, two small spots on succeeding interspaces placed obliquely, and two still smaller divided by the fifth subcostal branch, a minute spot at centre of interno-median interspace; a streak of yellowish appressed hair-scales on inner margin; fringe tipped with white at external angle: secondaries with a transverse series of four small cream-coloured spots beyond the cell; fringe tipped with white, most widely at anal angle: abdomen tipped with white; head bright golden-green. Under surface dark cupreous brown with bronze-green and purple reflections: primaries with hyaline spots as above, but the small interno-median spot extended forward and forked; an additional white subcostal streak towards the base: secondaries with a white spot, shot with lavender, at centre of interno-median interspace, and adjoining it, beyond the cell, a zigzag series of five lavender spots forming a large W-shaped pattern; fringe as above· body below white, venter barred with black. Expanse of wings 39 millim.

Zomba, January 1893.

Several of M. Mabille's species seem allied to this, but I have been unable to find one of his descriptions which characterizes it. *H. malthina*, Hewits., seems to be also allied.

151. Halpe lugens.

Pamphila lugens, Hopffer, Ber. Verh. Ak. Berlin, 1855, p. 643, n. 26; Peters's Reise nach Mossamb. v. p. 418, pl. 27. figs. 5, 6 (1862).

Zomba, July 1892.

152. Baracus fenestratus, sp. n.

Above almost exactly like *Isoteinon lamprospilus*, but slightly smaller and with the hyaline spots a little smaller; the grey-greenish hairy clothing of the secondaries extending over a much wider area; ground-colouring below like *B. septentrionum*, Wood-Mason, the primaries black with costal and apical areas broadly argillaceous, shading into dust-grey; fringe of the latter colour tipped with white; hyaline spots as above: secondaries golden argillaceous; a longitudinal greyish streak immediately below and bounding the subcostal vein; abdominal area dust-greyish; two small whitish spots on centre of median interspaces; fringe white. Expanse of wings, ♂ 31 millim., ♀ 35 millim.

Zomba, December 1892 and January 1893.

153. Ceratrichia stellata.

Ceratrichia stellata, Mabille, Comptes Rendus Soc. ent. Belge, 1891, p. lxx.

Zomba, December 1892.

154. Aeromachus? johnstoni, sp. n.[1]

♂. Bronze-brown: primaries with two unequal hyaline white dots within the end of the cell and a small subquadrate spot below the lower of them on first median interspace; a dot at basal third of second median interspace, and above it, towards costa, two unequal white dots placed slightly obliquely; base of costa and centre of inner margin slightly dusted with yellowish; posterior two-fifths of fringe tipped with sordid white: secondaries with yellowish hair scales in cell and interno-median interspace; fringe, excepting at apex, sordid white: head, collar, and patagia golden brownish; front of thorax glossed with green; abdomen greyish. Primaries below grey, the apical area and costa lilacine, clouded with blackish; hyaline spots as above; a white diffused streak at base of cell and a small spot across centre of interno-median area: secondaries lilacine-greyish along submedian vein; a dark brown irregular >-shaped band from apex across the disk: fringe of second joint of palpi and anterior femora long and bright yellow; venter greyish white. Expanse of wings 24 millim.

Mipa stream, Mofwi, August 3, 1892.

[1] I have placed this species at the end of the Hesperiidæ because it does not appear to me quite to agree with any of the genera indicated in Lieut. Watson's Revision of the family; from *Aeromachus*, which it most nearly approaches, it differs in the longer terminal joint of the palpi.

P.S.—I find that by some inexplicable oversight the slip of *Rhopalocampta forestan*, Cram. (which was represented in both collections), has dropped out of the MS.

Heterocera.

None of these were obtained by Mr. Crawshay, but Mr. Whyte's collection contained a fair series.

155. Cephonodes hylas.

Sphinx hylas, Linnæus, Mant. i. p. 539 (1771).
Zomba, January 1893.

156. Aellopus hirundo.

Macroglossa hirundo, Gerstäcker, Arch. Nat. xxxvii. p. 360 (1871).
Zomba, December 1892.

157. Chærocampa osiris.

Deilephila osiris, Dalman, Analecta Entom. p. 48, n. 21 (1823).
Zomba, July 1892.

158. Nephele funebris.

Sphinx funebris, Fabricius, Ent. Syst. iii. p. 371, n. 47 (1793).
Zomba, January 1893.

159. Ægocera meneta.

Noctua meneta, Cramer, Pap. Exot. i. pl. lxx. D (1775).
Zomba, July and December 1892 and January 1893.

160. Ægocera fervida.

Ægocera fervida, Walker, Cat. Lep. Het. i. p. 57, n. 4 (1854); Butler, Ill. Typ. Lep. Het. i. p. 12, pl. 5. fig. 1 (1877).
Zomba, December 1892.
A single worn example, with the outer border of the secondaries of half the usual width and tapering to anal angle.

161. Charilina amabilis.

Noctua amabilis, Drury, Ill. Ex. Ent. ii. pl. 13. fig. 3 (1773).
Zomba, December 1892 and January 1893.
The outer border of the secondaries slightly narrower than usual.

162. Xanthospilopteryx superba.

Eusemia superba, Butler, Ann. & Mag. Nat. Hist. ser. 4, vol. xv. p. 141, pl. 13. fig. 3 (1875).
Zomba, July 1892.

163. Syntomis ceres.

Syntomis ceres, Oberthür, Études, iii. p. 33, pl. 3. fig. 5 (1878).
Zomba, July 1892.
Evidently a common species: it differs from *S. kuhlweinii* in its larger hyaline spots; this distinction, though apparently unimportant, seems to be quite constant.